





spendence before the public, together with such remarks as I may think necessary to put the matter fairly before the public.

JAMES BROMLEY, Esq.

Mozley, near Wednesbury, Sept. 14.—Your favour of yesterday came to hand this morning. I do not make any objection to your publishing this correspondence.

THOMAS WYNN, Esq.

THOMAS WYNN.

JAMES BROMLEY.

#### COAL IN INDIA.

SIR,—During the present time, when the supply of coal is one of the chief topics of economic discussion, I may be excused for drawing attention to India—a country with which many associations are connected, but the mention of which usually excites no interest. That this indifference regarding it may be due to want of accessible information is possibly true; and I hope that the few remarks—based upon personal knowledge—which I have to offer will help in some measure to give that country a place in the coal summary of the world.

The broadest and most general statement to make is that India, with respect to the superficial extent of its coal measure rocks, stands fourth in the catalogue of countries, the United States heading the list with an area of 500,000 square miles. A proximate estimate for India gives 50,000 square miles. These figures for the two countries, however, do not convey a true idea of the relative amounts of coal, for the average thickness of coal in the Indian fields is very much greater than that of the fields of the United States, and when more reliable data are available than those which at present exist, it will probably be found that India will not be surpassed by any country in the world for actual quantity of coal.

The most extensive fields are those of the Central Provinces and Nizam's Dominions, and Assam, but the best known are those of Bengal. The Godavary and Waidha field of the Central Provinces is alone equal to the total productive coal area of England. Extensive fields occur towards the south-west frontier of Bengal, and a series of coal basins extends in a band between the 20th and 25th parallels of N. latitude, from Calcutta to more than half-way towards Bombay. Some of the coal seams are of enormous size; many exceed 40 ft. and 50 ft., while a few range to 100 ft., and even more. In these larger seams there are, of course, partings of shale, but still the proportion of coal is considerable. Before such giants the ordinary seams of Great Britain are dwarfed, and even the thirty-foot Staffordshire vein must bow its head.—14, Park-street, S.W. THEO. HUGHES.

#### COST OF COAL, AND ECONOMY IN MINING.

SIR,—I was not quite correct in saying that in mining machinery no improvement had taken place, inasmuch as the substitution of the plunger-pole for the bucket-lift was considered to be a most important improvement; the theory of its working is that the immense weight of the main rod is sufficient to overcome all friction of guides and stuffing-boxes, and to force the water simply by its own specific gravity, the engine power being employed, therefore, only to bring it back again, so that it is evident that twice the power required actually for duty has in the first place to be provided, and afterwards maintained and kept in motion, a system which works better for the merchant than for the mine adventurer.

My experience of mining has been gathered principally in collieries, and the theory of lowering down a shaft 2 tons of coal to lift 1 ton has not as yet obtained a footing, and if it is profitable with water it ought to be with coal, or *vice versa*. The only difference between coal mining and metallic seems to be that in coal a shaft is constructed as a permanent affair, while in metallic mines shafts are more or less speculative, which is an argument in favour rather of economy than unnecessary expenditure, and a moment's consideration of the effect of the one and the other will show sufficient inducement for the adoption of the most economical plan.

Of course, I only give approximate figures, but quite near enough for the purpose. A 60-in. engine, with all appurtenances, and 100 fms. of 12-in. pitwork, will not be a dear job at 15,000*l.*, and consuming about 15 tons of coal a week would be master of 300 gallons of water a minute, working well within power, and with returns leaving 60*l.* a month profit, such a mine would pay 5 per cent. dividends; while the same mine, with a constant throwing pump and 4-in. pitwork, and all necessary boiler-power, could be erected for considerably under 3000*l.*, and would command the water with under 5 tons of coal a week; therefore, the same profit of 60*l.* a month, added to the amount of fuel saved, would equal a dividend of 50 per cent. It is apparent, therefore, that in the one case a fall in standards means stopping; in the latter many such storms can be weathered, and Gawton meeting with no dividend, Tincroft no bonus, and Great Western ordered to stop, need never have been, instead of being, as I am afraid they are, only the beginning of the end.

R. LARCHIN.

Portugal-street, London, Sept. 19.

#### THE METALS AND THEIR ORES—SILVER—No. XXI.

SIR,—As explained in a former paper, the early inhabitants of Southern Europe acquired the art of mining and ascertained the intrinsic value of the precious metals from the Phœnicians and other Eastern traders visiting their coasts. As civilisation advanced the art extended itself into other countries in Europe, and ultimately to the New World. Accident appears, however, to have played an important part in the discovery of silver mines in ancient as well as in more modern times. The discovery of the veins of Saxony in the tenth century was owing to a party of traders, who quite incidentally picked up some glittering and attractive-looking substances they saw lying on the ground as they passed through the country. These proved to be samples of rich silver ores, although the merchants did not know it. Search was made, veins were found rich in silver and other metals, and for centuries the mines of Saxony have been remarkable for their productiveness. In the same century the Hartz mines of Germany were discovered by pure accident by a horse. A sportsman, named Ramm, whilst out hunting tied his horse to a tree in the Hartz Forest, when the animal, impatient at being left, began to paw the ground with his feet. Just beneath where he happened to be standing a rich vein existed, and when his master returned beautiful specimens of silver had been scratched from it. These were shown to the Emperor Otho, who sent experts to search the district, when ores, rich in silver, copper, iron, lead, zinc, and other valuable metals were found in the greatest abundance, and the Hartz mines have been celebrated ever since. History does not record what became of the horse. Some of the chief silver mines of Europe are to be found in Norway, Saxony, Hungary, Bohemia, Spain, and Germany. In Great Britain, although large quantities of silver are annually obtained from British lead, silver mining proper was never of much account—nevertheless, small quantities of the metal have been occasionally met with in Devon, Cornwall, and portions of Scotland and Wales. It is recorded that in Elizabeth's reign a number of German miners were brought over to work some silver mines in Cardiganshire—probably silver-lead mines. By far the most important silver deposits of the world are to be found on the American continent. In South America the silver veins of Bolivia and Peru have long been proverbial. The mines of Potosi, in Bolivia, situated on one of the lofty summits of the Andes, 14,000 ft. above the sea, returned silver to the Spaniards which has been valued at 235,000,000*l.* This vein was discovered in the sixteenth century by an Indian, who, as he was climbing the mountains on a hunting expedition, laid hold of a shrub to aid him in his ascent; the plant was torn up by his weight, and particles of silver were found clinging to the roots. The mines of Pasco, 14,000 feet high, in the Andes, were also discovered in the sixteenth century by a shepherd, who was agreeably surprised to find that portions of the rock on which he had lighted his camp-fire were turned by the heat into metallic silver. Further search was made, resulting in fresh discoveries, and the mines of Cerro de Pasco became famous. The proprietor of another Peruvian silver mine, at the celebration of the christening of his child, laid down a triple row of silver bars from his house to the church, and on this pavement the Vice-Queen of Peru, who was present at the ceremony, was invited to walk. In order to express his sense of the honour conferred upon him by his illustrious guest the worthy and fortunate mine adventurer presented the queen with the whole of the silver pavement, which she was graciously pleased to accept.

Few countries have surpassed Mexico in their silver-yielding capabilities, and the wonderful veins traversing the mountainous regions of this country require nothing more than a settled form of Govern-

ment and a more liberal mining code to render Mexico one of the richest silver-producing countries in the world.

Mining Offices, Shrewsbury, Sept. 18.

EDWARD GLEDHILL.

#### PRACTICAL MINING—VEINS SOMETHING SIMILAR.

SIR,—In the Supplement to the *Mining Journal* of Sept 7 "One Interested" enquires if any of your readers have met with anything like the following in their experience of mining in the "Cambrian system." As to the Cambrian system, it is a senseless, unmeaning term, misleading those who fancy they know what it means. Our "interested" friend's statement is—1st. A lead-bearing rock of a greenish colour, 10 fms. wide (evidently the wall of the vein).—2d. Quartz, 3 fms., with silver, lead, and blende (the matrix with its ores—of course there is always more or less of silver in all lead and blende ores). And again, another lode, parallel, of flookan, 3 or 4 fms. wide, and close up to this ironstone many fathoms.

It is very clear our "interested" friend has got a north and south course intersected by an east and west vein. The greenish-coloured rock, as he terms it, being the wall or cheek of the course, and the quartz being the matrix of the lead and blende; the flookan is the wall or cheek of the east and west vein, and the iron ore—for it cannot be ironstone—is the bearing of the east and west vein. As long as the two veins run together the workings will be very irregular, and sometimes unproductive, but when the east and west vein leaves the north and south course, then will be the trials of a long and productive mine, if the east and west vein takes the iron ore for a matrix for the lead and blende. The north and south course is sure to carry the hanging wall, and will become either a broad or a very narrow quartz barren vein: it will never carry the ores of lead and blende—it is contrary to all experience; therefore the whole breadth of the sun cheek or wall must be narrowly watched, or else you may proceed working on a barren quartz vein, leaving the east and west lode—the productive vein—behind. Similar veins have been worked on the east side of Cross Fell, Cumberland—one, a north and south course 50 feet wide, all quartz, containing gold; but when it was intersected by the east and west vein the appearance was flookan, or more properly clayshales, 3 ft. wide, fluor-spar, with stones of lead and blende 17 feet. Then the east and west veins, wall or cheek, flookan 4 ft. wide, then sulphur and lead 5 ft. wide, then iron ore proved 2 fms. These veins are passing through the western crop of the lead measures, which consist of 150 distinct strata, in which the whin is in strata 44 yards, and the deepest limestone 46 yards. There is a quantity of white carbonate of lead. These veins were never properly worked, and, therefore, are at a stand; they are heavily watered, and long carriage.

Rent's Bank, Grange, Carnforth.

GEORGE ATTWOOD.

#### THE MINING TIMBER QUESTION.

SIR,—Within the last nine months Norway balk has advanced in price nearly 30 per cent. In many mines this increased cost has become a very serious question, and, combined with dear iron and castings, and expensive coals, will lead to the "knocking" of many a promising "bal." As one deeply interested in western mining, I should feel not a little obliged if some of your "canny" readers would let the mining public know exactly what is meant by the "old," the "new" measurement, and what by the "Custom-house system." Enquiries have been made from time to time of the sellers of mine timber as to their mode of measurement, as a guide to correct their figures, but without getting definite information from any one of them; indeed, one might as well expect a mile-post to dance a jig by whistling to it. One timber merchant told me that he made out his mine-bills by the measurements given in by the Custom-house measurer, who he said was always a sworn man; and I added, in many instances, a sworn rogue, to be bribed by a 5*l.* note. It is admitted this precious measurer's entries may be taken as the basis for the Customs; but what is to hinder his collusion with the merchant, and making a second set of entries, and increasing the quantities? And I believe it is well known that some merchants are addicted to "scratching"—that is, erasing the Custom-house quantity-marks on the timber, and substituting others. Thus, a "2" is turned into a figure "4," "0" into a "9," and so on; and these timber-robbers enrich themselves by the plunder of mine adventurers, who frequently struggle to keep adventures afloat which are to the manifest benefit of the general public. I am informed, too, that Custom-house measurement never marks a piece of timber with half-a-foot; but on how many way-bills do we see this measurement—this considerate half-foot mark? Should any of the timber-merchants of Devon and Cornwall peruse this letter, perhaps they will let me know, independently of this Custom-house book, what the contents should be of a piece of Norway balk of the following dimensions, and of their mode of calculation expressed in figures:—Say, a piece 30 ft. long, with a girth, by tape, at one end 24 in., and the other end 16 in., or a mean girth of 20 inches? IRONPEN.

Plymouth, Sept. 17.

#### NEGLECTED INVESTMENTS.

SIR,—Whatever may be the reason, it is no less curious than true that the investing public manifests as much neglect of certain securities as it favours others in no way superior, either as regards security of invested capital or the rate of interest returned. It is also a fact that the "favourite investment" of to-day is often in turn the "neglected investment" of to-morrow, and *vice versa*. The judicious investor, therefore, does well when he exercises a little discrimination in his selection, and takes care that he is not paying too dearly for stocks generally fancied by the public. On the other hand, it is wise when all surrounding circumstances are favourable to place at least a portion of capital in neglected securities, for sooner or later their turn of favouritism must come, and their market price, consequently, be enhanced. It is but a few weeks ago, for instance, that London General Omnibus shares were quoted below 90; we pointed out this discrepancy; attention was also drawn to the company in some of the financial papers, and now the stock is quoted at about 105. Even this is below the real value of the stock, and the investor who patronises Omnibus shares is sure to do well, as in addition to receiving a dividend of 8 per cent. the price of the stock is sure to advance. Again, the 6*l.* shares of the Fairbairn Engineering Company (5*l.* paid) pay 10 per cent. per annum, Hudson's Bay pays 10 per cent., the India Rubber Company pays 12½ per cent., Liebig's Extract of Meat pays 9 per cent., Telegraph Construction and Maintenance pays over 9 per cent., Fore-street Warehouse pays over 8½, Hooper's Telegraph Works pays 8½, and North of Europe Wood Pulp Company (5*l.* fully-paid shares) pays 10 per cent. These companies present many points of great advantage to the investor. The North of Europe Wood Pulp Company, for instance, has only been established twelve months, yet out of the profits of this period the directors have paid the handsome dividend of 10 per cent., and carried forward a good balance. A very large demand exists among paper makers for the article manufactured—larger than the present means at its command enables the company to meet—and on every ton of pulp sold a good profit (more than the directors care to state publicly) is secured. This being so, it has been determined to issue the unallotted shares at par, in order to erect additional mills in this country. These shares are being rapidly subscribed privately—the more readily owing to the fact that several most important contracts have lately been secured at remunerative prices with large firms in the North of England. The existing mills at Dorchester, supplied with splendid water-power (no mean advantage in these days of dear fuel and labour), are running day and night, but are totally incompetent to meet the enormous demand daily on the increase. In investing in trading companies of this nature the investor should be careful to ascertain that his resources are sufficient to meet without inconvenience any calls which may be made, for in many instances the shares have heavy liabilities attached to them. This is not the case with the North of Europe Wood Pulp Company. The shares are 5*l.* each, fully paid, and share warrants to bearer are issued, if desired.

Many iron and coal companies have a claim to be considered as "neglected investments." Large dividends are paid, but the market price generally rules low. As a class, however, these investments are of a somewhat uncertain character, and the holders of shares,

in order that they may obtain a regular income without great risk, ought to make certain arrangements. In the first place, as the dividends are liable to vary from time to time, the holder should provide for times when his returns may be small at those periods when large profits are being divided. Companies of this kind being engaged in one branch of business only, it follows that sometimes the profits may be very large, and at other seasons they may be small. Consequently, if the investor spend the whole of the dividends in the good times he will find his income considerably reduced in the bad times. Some companies provide for these contingencies by the making a special reserve fund in prosperous periods, in order that they may as far as possible equalise the dividends. It is not always, however, that the shareholders will submit to having a portion of their profits kept back from them, even though it may be with a view to their benefit. In consequence of the dividends varying to a great extent in different years the market value of the shares fluctuates considerably. And as the price will, of course, be low when the dividends are small, the careful investor will not run the risk of being compelled to sell at such times; but unless he provides when the dividends are large for a future falling off, it is possible he may find himself obliged to sell on a bad market. For the same reason—namely, that the market price is liable to heavy fluctuations—the shares of iron and coal companies are not suitable investments for persons likely to require their capital suddenly, as they may be forced to sell at an unfavourable time. The number of iron and coal companies quoted in the London Stock Exchange list is not large, but many are quoted in the Manchester, Liverpool, and Glasgow Stock Exchange lists. There is ample room for good investments amongst the shares of these companies. We have stated plainly their disadvantages, but, on the other hand, it must in justice be said that, as a rule, they are most ably and honestly managed, and give exceedingly remunerative returns. The Wigan Iron and Coal Company, in their report for the six months ending June 30, state the net profits at 104,778*l.*, with 10,222*l.* from the previous half-year, making a total of 115,000*l.* available for dividends; and this, too, after setting aside 24,577*l.* for depreciation, spending 14,367*l.* upon new works, returning 20,362*l.* received in advance of calls, reducing the debenture debt by 2550*l.*, and paying 6104*l.* in debentures. Out of the 115,000*l.* the directors declared a dividend at the rate of 10 per cent. per annum, set aside 22,000*l.* to a reserve fund to provide for contingencies, and carried forward 2515*l.* The present price of the shares is about 102½; the large amount per share no doubt militates in some measure against the market value. The directors of Bolekow, Vaughan, and Co., have declared an interim dividend for the half-year of 17 10s. per share, 35*l.* paid, or at the rate of very nearly 18 per cent. per annum. The dividend for 1871 was 20 per cent., and 16*l.* per cent., and the lowest dividend paid since the establishment of the company has been 10 per cent. The present price of shares is about 85, so that they may be stated to be fairly appreciated. The Rhymney Iron and Coal Company earned 61,660*l.* in the year ending June 30, out of which a dividend of 5 per cent. was declared, making with that paid in February 8 per cent. for the year, the reserve fund having been increased to 109,663*l.* With all this, the 50*l.* shares stand at about 47 10s. Shotts Iron Company is a well-known Scottish establishment, with a capital of 267,000*l.* in 50*l.* shares. The dividend has just been announced as 15 per cent. for the half-year, making, with interim dividends previously paid 18 per cent. for the year. It is proposed to increase the capital for the extension of the works. The present market value of the shares is 90*l.*, at which they pay 10 per cent. to the investor. The Sheepbridge Coal and Iron have paid a dividend of 4*l.* per share (55*l.* paid), making 6*l.* for the year, equal to about 11 per cent., whilst 10,000*l.* has been added to the reserve fund. The market value is about 69*l.* per share. The Consett Iron Company gives a dividend of 20s. upon each 7*l.* 10s. share, or about 12 per cent. for the half-year, and as an additional bonus one 10*l.* share, 7*l.* 10s. paid, to the holder of every five shares. The present price is about 19*l.* 10s. per share. Sir John Brown and Co. at their annual meeting declared a dividend of 7*l.* per share, making 10*l.* 10s. for the year, or something more than 15 per cent.; 17,335*l.* was added to the reserve fund, making it 65,477*l.* The company has, with Bolekow, Vaughan, and Co., become possessors of iron ores in the North of Spain, and are about to make a short line of railway between the deposits and the shipping ports, so that they expect shortly to command such a supply of iron ore as will make the whole of the Bessemer pigs required for use in the works. An interest has also been secured in a large coal field, from which they expect to draw, within 12 months, the whole of the coal required. The 100*l.* shares, 70*l.* paid, are at 81. The Ebbw Vale Coal and Iron Company paid a dividend of 20s. per share for the six months, making, with the interim dividend, 30s. for the year, or just under 5½ per cent. per annum. The 32*l.* shares, 27*l.* 10s. paid, may now be purchased for 24*l.* The Mwyndy Iron Ore Company paid an interim dividend of 1s. 6d. per share, being at the rate of close upon 5 per cent. per annum, and yet the 4*l.* shares, 3*l.* 10s. paid, are to be purchased for about 17 15s.

The companies established within the past year have been quick to enter the list of dividend-paying enterprises. Thus the Benbar Coal Company has paid a dividend of 12s. 6d. per share, being at the rate of about 18 per cent. per annum. The 10*l.* shares, 7*l.* paid, stand at 14*l.* The Stranton Steel and Iron Company has paid 7½ per cent. for the six months, being at the rate of 15 per cent. per annum; the Chillington 4s. per share, being at the rate of 10 per cent. per annum; the South Cleveland an interim dividend at the rate of 8 per cent. per annum; the Lydney and Wigpool 3s. 9d. per share, being at the rate of 7½ per cent. per annum; and the Central Swedish Iron and Steel an interim dividend at the rate of 9 per cent. per annum. The Lydney and Wigpool 10*l.* shares, 6*l.* paid, are at 1 prem., and the Central Swedish 50*l.* shares, 40*l.* paid, 34s.

Another neglected investment is the Russia Copper Company. After the satisfactory manner in which Capt. Beaumont reported on this company a few days since it is impossible to surmise the reason of the present depression in the price of the shares. They are well worth purchasing up to 8*l.*

North-Western Railway stock now stands at nearly 150*l.*, and the dividend lately declared was at the rate of 7 per cent., thus paying the purchaser only 4½ on his investment. French Cable shares are quoted at about 2 premium for the 20*l.* shares, the dividend paid for last year being 12 per cent. (14 per cent. was earned, but 33,700*l.* was placed to reserve), thus paying the purchaser 10*l.* 18s. 2d. per cent. In other words, 1000*l.* invested in North-Western Railway stock brings in an income of 46*l.* a year, whereas the same amount invested in French Cable shares brings in an income of 109*l.*, the difference being 63*l.* in favour of the investment in the latter company. Has not the French Cable a right to be called a "neglected investment?"

Mining is also undoubtedly a neglected form of investment, and this is to be traced to one great cause. Many investors are willing to run a certain amount of risk for the sake of corresponding profit in the shape of good rates of interest for their money, and they are willing even to face the possibility of the whole of their capital invested being lost; but beyond this they have a very decided objection to go—that is to say, they will not incur any liability beyond the actual amount of money they invest. To investors of this class, therefore, the great bulk of mining shares are securities of a kind at which they will not look. However prosperous or promising a mine conducted on the Cost-book System may appear at the moment of investing, there is the possibility of a heavy call being required, perhaps, when it is most inconvenient for the investor to pay it. The Cost-book System, without question, keeps out of mining adventure a vast amount of capital which would otherwise be available. Not that the Cost-book System, honestly worked, is not productive of many peculiar advantages not otherwise obtainable, but it is meant to be the means of conducting mining operations where the adventurers are comparatively few in number, where there are few out-advancers, and where everyone takes a personal share in the management, and looks after his own interest. As originally worked, what could be more simple and satisfactory? Now, when out-advancers exceed in number those on the spot, what can be more cumbersome, more uncertain, and more unsatisfactory than the Cost-book System? The recent examples of Pendarves United, and of South France, are not likely to increase the general confidence in the system, and Cornish mine managers would do well to conduct their



business more in accordance with the advanced views of the outside world, and more capital would assuredly flow into the county, to the great benefit of "One and All?" Another great disadvantage of the system is that when a temporary panic seizes shareholders really good assets are given up, when the expenditure of a few pounds is only required to lay open and bring to surface riches sufficient to pay good dividends. A case in point is Carsize. Had this mine been started on the limited liability principle sufficient capital to prove it would have been provided on the outset, and doubtless success would have been achieved by the exercise of a better patience.

Another thing which militates against the popularity of mining is the high denomination of the shares. Few can afford to embark 170*l.* in the purchase of a Carn Brea share, yet many would gladly give 1*l.* for the two-hundredth part of one, equal to an increase of 30*l.* in the market value: 14 shares, fully paid, with the convenience of share warrants to bearers, are all that is needed to make mining as popular an investment as any other form of joint-stock enterprise. The directors of the Mossdale Mine (a most promising sett in Yorkshire) have perceived the truth of this fact, and have wisely reduced the 5*l.* shares to 1*l.* each, increasing the number of shares from 4000 to 20,000. A totally new class of investors has embarked in joint-stock enterprise since 100*l.* shares were in vogue, and it behoves all who desire to place mining adventures attractively before the public to study well the wishes of investors, particularly when they are so reasonable as a desire to limit the extent of their liability. There are, first, the shares which are in scrip to bearer; and, secondly, the shares which are paid up. With regard to the shares in scrip there is no liability, because scrip to bearer is never issued until a share is fully paid up, and an investor may hold them without anyone, even the directors or secretary, being aware of the fact. When the shares are purchased the scrip is simply delivered to the buyer, who accepts no transfer, neither does he enter into any agreement or accept any liability. Should he desire to get rid of the shares he may, at the worst, burn the scrip, and there is an end of the matter. We are conscious that we are not the first who have promulgated these (in Cornwall, heterodox) statements, but we feel confident that much benefit would immediately result from a general change, from the cost-book to the limited liability system; not, however, with such a heavy liability hanging over the heads of the shareholders as in the case of Devon Great Consols.

T. W. HARLAND and Co.

Gresham House, London, Sept. 26.

### THE SCIENCE OF INVESTMENTS.

Sir,—The true wealth of a nation consists in the abundance of its healthy, vigorous, and virtuous inhabitants, able and willing to do their share of the country's work, notwithstanding all modern political economy to the contrary. It is possible that a country may become over-populated, but, doubtless, this has never yet happened in the history of communities; it certainly is not the case with us—the Mother Country—nor is it so with any of the Queen's colonies. Virtuous manhood, not material wealth, constitutes the true wealth of a nation; wealth should ever increase, decay commences whenever action is dormant; and if this is so it is difficult to conceive how mankind can be multiplied to superabundance. But even were there a tendency in this direction emigration would, under a proper state of things, provide an adjustment by attracting men away with the promise of prizes in new lands, rather than forcing them from their own country through destitution and suffering. As for our own country, there is work to be done in England, remunerative work, and plenty of it; and, moreover, there are active brains, clever heads, and strong hands to do it. Then why is it not done? Why is it that our skilled artisans are leaving the land of their forefathers, as it is said rats leave a doomed and sinking ship? We must not forget that emigration has hitherto drafted off the most able and enterprising of our inhabitants, in fact, the best of our young, healthy, and prospectively valuable men. As a rule, it takes off no criminals, no paupers, no sick, no infirm, no lunatics, no drunkards, no lazy good-for-nothings; but, leaving those behind, materially lowers the average standard of our national character.

It is not that population is too dense, but that, so far as commercial matters are concerned, society is out of joint. In a great commonwealth like England, where men have diverse interests, there ought to be a regulating power to keep the machinery of commerce and enterprise in motion. Stagnation is ruin—action is the soul of success. But the fly-wheel of our delicate system of finance and credit has been rudely disordered—nay, been literally broken to pieces—and for several years past there has been no proper regulating force to check unscrupulous trading, or to foster and help the industrious, enterprising, and intelligent man of business in his arduous and struggling progress in life. Capital is not at the command of the honest and thrifty miner, artisan, or mechanic: to them credit is dormant, or, to say the least, jarring and heart-breaking. The modern capitalist has no common interest with industry, but has really an antagonistic and obstructive tendency to observe. He cares not one whit whether the man to whom he lends his money be a knave, or fool, or both, so long as he receives in exchange that which he regards as a good security, and believes his money to be safe, as, in fact, at the time of "parting," there was a ready market for realisation.

Since the Legislature has practically done away with imprisonment for debt credit has practically ceased to exist for all except the merchant and trading community. The strength and marrow of society are excluded from the magic circle wherein money exists. As a natural consequence, the profits of trade have been reduced by fierce competition, while over-trading has been fostered by joint-stock banks, established one after the other in endless succession, until the trade of the country, both at home and abroad, has become a gigantic system of pawnbroking, of which the merchants and manufacturers avail themselves for the purpose of raising money; and it is lamentable to reflect upon the abuses that have crept into our system of credit and finance, and the frequent instances revealed of merchants and traders carrying on business solely for raising instead of making money. The primary object is to stop the "gaps" incipient to over-trading, and the profits far too generally gravitate into the pockets of the money-lenders. We may be reminded that there are many firms in the City that are realising vast fortunes, still, experience shows in most instances they do so as money-lenders, and not as legitimate merchants; in fact they are, as a rule, nothing more or less than successful merchant pawnbrokers, acquiring gains not on the consignment of merchandise to foreign markets, but on advances made to others who make these consignments, and who cannot survive an hour if they arrest the ceaseless round of their speculative dealings.

Our forefathers watched the markets, and operated only when it was safe and prudent, and they generally acquired certain profits; and, moreover, they were careful to provide a substantial reserve fund. We, their degenerate sons, dare neither to wait for opportunities, nor to take counsel of our judgment, but go on with a ceaseless round of critical adventures, for to pause in the wild career is certain destruction. Our fathers accumulated fortunes, and transmitted a sound business from generation to generation. We, in the terrible competition that we have created, are driven to transactions both of equivocal character and exaggerated magnitude, hence the guardians of finance, "directors and trustees of joint-stock banks," are inflated with the power they possess, and pursue a mad career of reckless trading wholly upon credit, as is unhappily too evidently demonstrated in the collapse of Messrs. Gledstanes, the merchant magnates of the Oriental colonies, trustees and directors of the London and Westminster Bank, as well as the occupiers of a purple seat on the direction of the Bank of England.

The finances of the country being to a great extent now in the hands of non-responsible joint-stock banks, discounts and finance directors and managers, no great surprise can be expressed at the decadence and decline of others, less favoured by the rulers of these mighty machines of capital and credit—but the questions to consider are what will be the effect of the next panic or commercial collapse now that the capital of the country is at the disposal of merchant pawnbrokers, and not applied to the sinews and strength of the industrial classes—i.e., the working miner, mechanic, artisan, manufacturer, builder, and labourer engaged in the active arena of

productive enterprises? The speculative miner can get no relief or accommodation to develop his property and enable him to produce his ore, yet the smelter, the merchant dealer, and the manufacturer, with the tradesman who vend the wares, can each get accommodation from his banker or pawnbroker, and thus conveniently carry out his dealings. The same argument applies to every other branch of productive industry. The farmer can get no advance on his growing crops, he must reap before he receives his award of gains; not so, however, with the agent who sells his grain and cattle, the merchant who buys, the broker who sells for the merchant to the miller, and the tradesman who sells the flour; each and all can get accommodation from his banker, and credit is given for the same produce four or fivefold over its actual value. It is thus that trade and commerce become inflated and fostered through extended credit; the chief gains go to the pawnbroker, the industrial classes are wholly neglected, they have to rest solely on their individual resources, unaided by those who possess intelligence, industry, and enterprise, and who constitute the strength and power of the middle classes of English society, in making a start in the Mother Country; thence they emigrate to Canada, America, Australia, and foreign countries, where labour is appreciated and rewarded, and where the necessities of life are cheap and abundant, while at home the quality of labour is depreciated and the price of virtuals enhanced through the application of capital to commerce, and almost to the exclusion of productive industry and the extinction of native individual spirit.

In October, 1869, I drew attention to the Dolcoath Mine, and also to the London and South-Western Bank. After the lapse of three years these two companies compare as follows:—Dolcoath has increased in market value from 180,000*l.* to 320,000*l.*, and is dividing gains of about 50,000*l.* annually. The London and South-Western Bank is now selling at 150,000*l.*, with 200,000*l.* paid-up of its capital of 1,000,000*l.*, against 80,000*l.* three years ago, while the dividend is simply 5 per cent. annually, a discount still of 25 per cent. in market value—say, 10,000*l.*, or one-fifth of the gains of either Dolcoath or Tincroft Mines.

I extract the following from my pamphlet, the "Science of Investments," October, 1869, pp. 37, 38:—  
"THE LONDON AND SOUTH-WESTERN BANK has already abandoned three of its provincial branches, and opened another metropolitan one. The paid-up capital is 1,000,000*l.*, being 20 per cent. only of the subscribed capital of 5,000,000*l.*. The reserve fund is only 800,000*l.*, whilst a credit balance of 787,15*l.* 9*d.* only is carried forward, including rebate of bills discounted but not yet matured. In fact, the real balance in hand is only 33*l.* 5*s.* 6*d.* The half-yearly dividend was 2500*l.*, to meet which the gains were absorbed, together with a sum of 641*l.* 10*s.* 10*d.* withdrawn from the previous half-yearly balance. The deposits on current accounts amount only to 304,298*l.* 9*s.* 2*d.*, and the shares sell at 60 per cent. discount, with 80*l.* subscribed capital striding the shareholders in the face."

"THE DOLCOATH MINE, once famous for the yield of copper, and now of tin, is a prize of a century's growth, and, notwithstanding the wear and tear of ages, is as firm, expansive, and vigorous as ever. The spring and elasticity of manhood is still discernible, and the existing company, at the age of 69 (1806), is as full of prospective promise as ever. The two monthly dividends are 3*l.* per 1432nd share, (say) 18*l.* annually, equal to 14*l.* 8*s.* per cent. on the market value of 125*l.*. The reserves are computed at 800,000*l.*, to 1,000,000*l.*, and the deeper the mines are explored the larger are the returns, and, at the existing prices of metals, profits will augment rather than decrease. The machinery on the mine is regarded by practical authorities, both in drawing from underground, and in manipulation of ores at surface, as equal to the best in Cornwall. Dolcoath will be a profitable mine half a century hence, whilst the London and South-Western Bank will either flourish or succumb to the growth or failure of business, which will, or may not, enable them to better their present position."

The "Science of Investments" is a question of first moment to both capitalists and speculators, but especially so as regards the former. The true value of property should alone attract *bona fide* and legitimate purchasers into competition with speculators and concocters of raw companies and hazardous schemes. The latter should never engross the attention of the earnest disciple of the "Science of Investments." Inflated prices, feverish quotations, capricious and ever-changing rumours, conduce alone to speculative dealings on the Stock Exchange. But the man who wants to lay out his money for security of principal and receipt of good and remunerative dividends must be earnest and searching in his enquiry after truth, and grasping when acquired in its application to the future rather than the past, then with the exercise of ordinary caution and discrimination there is no more difficulty in selecting good mines than exists in the choice of securities appertaining to every other medium and class of property. There are as good "fish in the sea as ever were caught," and as good mines to be discovered as ever distinguished this branch of our home industries; while, in conclusion, every practical authority could easily direct the attention of the uninitiated to two, four, or six companies that embody the true elements of success, and which require only capital and skill to render them highly profitable, and conducive to the interests of capitalists. *Nil desperandum* should be the watchword of every true-bred miner—hope is the talisman of prosperity, and as the ore is hidden from sight despair should never enter the soul of the pioneer-workman, whose energies no obstacles should daunt, or strata resist, in their slow, though certain, progress to success.

R. TREDINICK,

3, Crown-court, Threadneedle-street, Sept. 19.

Consulting Mining Engineer.

### THE SCIENCE OF INVESTMENTS.

Sir,—Now that the Bank minimum rate of interest is raised to 4 per cent. we possess a slight foretaste of the future. That an advance to 5 or 6 per cent. will follow I verily anticipate. It behoves all to watch the movements of France and Germany. If Prince Bismarck failed through French finance to withdraw every napoleon or half-napoleon from "La Belle," it is incumbent for us to guard against English gold replenishing the German coffers. That England is now the emporium of the world, so far as the currency is concerned, all thinking men acknowledge as well as know; and with this foresight into the future it is necessary that England should adopt prudential measures to protect its "bullion." For every 100,000*l.* withdrawn the Bank must receive notes, and its liabilities will diminish in proportion to the withdrawal of its specie. It hence follows that the London Joint-Stock Bank, as well as the London and Westminster and other joint-stock banks, should foster their resources, and remain in a position to meet their commitments without too freely applying to the parent establishment in Threadneedle-street. That there will be a sad and imminent pressure on the restricted resources of this country to accomplish the transfer of the war indemnity from France to Germany in cash payments everyone foresees. Hence one of these alternatives will assuredly follow—that the Bank Act must again become suspended, and prove itself in times of pressure a "nullity;" or the creation of 1*l.* notes must be authorised, or the last course adopted by the Bank of England—to allow interest on deposits, and thus openly compete with other joint-stock banks in the finance and commerce of the country. Either alteration will seriously disturb business, and in all probability lead to radical changes, and probably serious collapse in our fiscal establishments. But what is the Bank of England to do? If the extended and expanding commerce of the country require increased facilities of circulation the time has arrived when they must be yielded or given to our circulating medium, or the Bank of England must seek relief through its own power and strength. It is a fact worthy of notice that if the bankers' clearing-house were extinguished the whole currency of the Bank of England would not admit of a single day's settlement of the fortnightly "Stock Exchange account."

R. TREDINICK,

3, Crown-court, Threadneedle-street.

### FLORENCE TIN MINE—SOUTH GREAT WORK.

Sir,—Being a constant reader of your valuable Journal, my attention has from time to time been attracted by the very excellent reports from the Florence Tin Mine and the South Great Work Mine. I had expected long ere this to have seen it published in the Journal that 20 tons of tin per month was being sold from the Florence Tin Mine—for, surely if a mine is literally full of tin, or even if the lode is only worth 100*l.*, or 80*l.*, or even 50*l.*, or 40*l.* per fathom, which values are generally stated as the correct value of the lode in the different levels, they would not require to stop many fathoms of ground to get 20 tons of tin per month. I think it was also stated that they were raising as much tin as was required; therefore, some of the rich pitches were not working. This is certainly an excellent position for a young mine to be in; but, looking at the high price of tin (30*l.* per ton), and then, on the other hand, the very high price of coal and every other material required in a mine, and the increase of miners' wages, surely an extra ton of tin would be very acceptable even in a rich mine. Having taken a tour through the neighbourhood in which these mines are situated, I was induced to ask what returns of tin are being made, and, to my great surprise, I was told that from the rich Florence they are selling something like 15 cwt. of tin per week. Surely there must be something beside tin, or do the agents value the lode from a rich stone of tin that they may from time to time find in the lode, or do they examine the tinstuff through a magnifying glass?

SOUTH GREAT WORK.—I believe it was stated some time in May that the new

16-head stamps was nearly completed, and that large returns of tin may now be expected. Seeing that four months have passed away and no tin sold, perhaps the agents will inform us, through the Journal, how many tons of black tin they have stored away in the tin-hutch, and when the smelters are likely to have some 10 or more tons brought in from this valuable mine?

LOVER OF LEGITIMATE MINING.

### WHEAL GRENVILLE.

Sir,—I think your readers will pardon me if I do not imitate the style of the secretary of Wheal Grenville.

The main points at issue are very simple, and have arisen in this way. Many persons, and among them practical miners, held the opinion that if South Condurrow lode should be cut in Grenville at the 140 as large machinery might not be able to cope with it. A few of the shareholders also held the opinion that, even with the bare possibility of an outlay for more machinery, the last dividend ought not to have been paid, especially as it could not be paid without borrowing money to pay the current cost of the mine.

How far the opinion in regard to the water question was justified, or had any "particle of truth" in it, any reader of the Journal may inform himself by referring to the agents' reports, which for several weeks after cutting into the capels of the lode, spoke of the constant trouble in keeping the water down, and at last the machinery was overpowered altogether. Then, a larger and much more expensive change made in the pit-work—considering the increased strain it would be on the flat rods—would prove to be anything more than a temporary expedient. If the mine could be worked "properly and economically" without further machinery or another shaft, I added that I hoped the agents would tell us how.

The agents are silent; but the secretary, upon the old principle that where there is no case "abuse plaintiff's attorney," accuses me of ignorance, and of silly and mischievous statements. He says that "any person with the slightest knowledge of mining affairs knows that if a 60-inch cylinder engine can keep a shaft drained 140 fms. deep with a 12-inch pump, at four strokes per minute, it can be very safely worked to a far greater amount of duty." Granted, but he omits to tell you that the engine is more than 70 fms. distant from the western shaft, and that the pumps are worked by a long line of flat-rod; that the larger the pumps the greater the strain upon these rods, and in the breakage of any one of them lies the real danger. I said that I had written you nearly two years ago and informed you that of the two cross-cuts the 140 was the most important, inasmuch as the other, the 110, was useless. This, in the secretary's opinion, is a clear proof of my ignorance, for he says the north shaft was always considered the most important part of the mine. No doubt it was, and I led you to infer so, from the fact, which I then stated, and again repeated in my last letter, that the 110 from the north shaft was opposite and nearest the rich course of ore in South Condurrow (in fact, the men working in Grenville told me they could hear the men working in South Condurrow), while the 140 cross-cut was 85 fms. further west. I wrote of the useless cross-cut, not of the shaft, and as this cross-cut had to be stopped, the 140 was the only cross-cut which could then be driven to prove the South Condurrow lode, and, therefore, was the most important. And there was another thing which the secretary omitted to mention in regard to this northern shaft: it had been sunk to about the 50 perpendicularity, and then down to the 110 in the incline away from South Condurrow, and every fathom sunk, and which has since been sunk, has gone further away from the lode.

Again, the secretary states—1. That the lode was cut in the 140 cross-cut six months short of the time I mentioned; and 2. South Condurrow engine has not been overpowered two years. In reply to these statements I merely observe that I was on the Grenville and South Condurrow Mines in March, 1871. The water was then in South Condurrow, and the cross-cut at the 140 at Grenville had, as I understood from the agents, been commenced some time, but even if it had only been commenced that month, how far short was it of what I stated—"nearly two years." But this is the sort of quibbling the secretary is reduced to in answering every point of my letter.

Again, the secretary states that "ever since we have worked Wheal Grenville we have known of the difference in the levels, so that the result of 'Argus's' investigation was nothing more than our agents knew long before the 110 cross-cut was commenced." What then, Sir, should we say of our secretary and agents who thus spent hundreds of pounds of the shareholders' money in driving a useless cross-cut? But I assert most positively, and I challenge Capt. Bennett to contradict me if he can, that neither he, nor the late Capt. Odgers, knew that the 110 (and this was the assertion in my former letter) was only equal to the 90 in South Condurrow until I told them of it, and Capt. Odgers, at first, could scarcely believe it.

The secretary wonders that if I am a shareholder, how is it that I should write against my own property. My answer is, my strictures were upon the management, not on the mine. I have the highest opinion of Grenville, and have consistently been its oldest and firmest supporter. But I have wished to see it worked in a legitimate and proper manner.—Sept. 14.

ARGUS.

### WHEAL GRENVILLE.

Sir,—After writing you on Saturday last I requested one of the first practical agents in Cornwall to inspect Wheal Grenville, and to answer a few questions with regard to the machinery. His report I have not yet received, but the answers, written opposite my questions, I got this morning. The agent referred to knew the South Condurrow lode well, has several times inspected Wheal Grenville, and has always had a high opinion of the mine.

Question: Do you consider any extra weight on the rods, pumping with 12-inch pumps from a shaft 140 fms. deep, likely in the winter time to break or get the rods out of gear? And, if one did break, would it not flood and seriously impede the working of the mine?—Answer: I do consider that extra strain with pumping with 12-inch pumps, and travelling quick, is likely to break the rods in the winter time. And, if one should break it would seriously impede the working of the mine. At present these rods are only pumping from the 140 to the 120, so that they are not heavily loaded as yet.

Question: Did you inspect the mine during the time the 110 fms. level cross-cut was driving, and did you express your surprise at it?—Answer: I did inspect the mine during the time the 110 fms. level cross-cut was driving, and expressed my surprise that they were driving a cross-cut to unwater South Condurrow lode, without having any backs to work if the lode were cut in the sett.

Question: Is it a fact, or not, that the further South Condurrow lode is cut into the more water flows from it?—Answer: I think the further you cut into the lode the more water you are likely to meet with.

I trust, Sir, that these answers, bearing directly upon the main points of my letter, will show that I was not quite so ignorant of my subject as the secretary would lead your readers to believe.—Sept. 19.

ARGUS.

### THE GROGWINTON LEAD MINE.

Sir,—I read with much interest the report in last week's Journal of the meeting of the shareholders in this company. Having known the mine for many years, I am in a position to confirm the theories of the Chairman as to the great productiveness of the lodes, but there is one point that it seems to me he has altogether missed, and that is the great run of valuable ground standing on the south or No. 1 lode, to the east or right hand of the deep adit level cross-cut, and formerly known as Ellis's workings. Very truly Mr. Ross said Bonall's workings had yielded, and would still yield, large quantities of ore, but I think it will be found that to the east vast quantities of valuable ore ground, richer than Bonall's, is still untouched, and I also know that my opinion of this part of the ground was shared in by the late Matthew Francis, than whom no man more thoroughly understood the many interesting features of this mine. It is only necessary to drive in another short level about 100 yards above the water level, and this lode will be cut in less than 20 fms. driving, and I think it will come in at a point to the east of Ellis's workings, but under a small shaft, from which tributaries were getting very good ore. I will with pleasure point out the spot I mean, and I hope the company will give this some attention.—Sept. 18.

OLD MINER.

### GREAT NORTH LAXEY MINE.

Sir,—In the Supplement to last week's Journal there appeared a letter complaining of the irregularity of the reports furnished from Great North Laxey; but how are we to account for the violent fluctuations that take place in the prospects of the mine? Vide the Mining Journal, August 24, where it is stated the lode in the 110 North is worth 1½ ton per fathom; since then to Sept. 10 it has been driven 1 fm., and is now worth nothing to value. On the same day the sump, sinking from the 96, was worth 2½ tons, and was daily improving. Yet on Sept. 10 it is reported to be sunk 1½ fm., and to be worth 1 ton per fathom, so that instead of improving it is now composed of rock, quartz, and a little lead.

Surely, like our neighbour Great Laxey, it is time we looked into our affairs, or be prepared to meet the fate of Rennie Laxey and East Laxey. I suspect you will find, when those mines collapsed, the promoters who had such faith in them were no longer shareholders. If anyone interested in the matter will read over the reports emanating from Great North Laxey for the last four years, they will find the same strange appearance and disappearance of lead, while the dividends so frequently promised seem as far off as ever.

An attempt was made some years ago to obtain a different management, but failed, Capt. Rowe being supported and upheld in his position by Mr. G. W. Dumbell. Let us try again: Mr. Dumbell may not now prove so warm or so able a friend. The directors of Great Laxey write to the shareholders that the men have just cause of complaint against the managers, some of them not being paid for the work they did when due, while others were paid for work they had not done. Let us enquire whether the capital of Great North Laxey is being dissipated in the same unsatisfactory manner.—Kensington, Sept. 14.

A SHAREHOLDER.

### CRIDDIS COPPER MINE, PADSTOW.

Sir,—I was pleased to see a letter, signed "Shareholder," about Criddis Mine, in the Supplement to last week's Journal, to the effect that it is more than likely it will make a start again under most favourable circumstances. I know a little about this mine. I was there when the engine started in 1864. At that time it was under Mr. David Stickland's supervision, now manager of Burrow and Butson, St. Agnes. I wish him every success, and hope he will be better treated by that company than he was when manager at Criddis. There is a splendid 40-in. engine on the mine, and all that is required is a boiler and pitwork to fork the mine at once. It will be easy to start, and very little trouble and expense to see the bottom. There is an account-house, blacksmith's shop, material-house, carpenter's shop, engine-house for drawing, and engine and crusher house. See what a saving of expense this will be to a company coming in!

As "Adventurer" says, the ore is of rich quality, there being so much silver with it. Some forty years since this mine paid thousands of pounds to its adventurers, I have been told by one or two old men living in the parish, and who worked on the mine, I quite coincide with "Adventurer" that if it had been worked by the manager in a miner-like manner it would be working to this day: there is no doubt in the world, because if the manager lived some 15 miles away from the mine, who was to look after it in his absence? "Adventurer" says if they had coined sovereigns the mine never would have paid under such management. I most be-



tains believe that as well. Here are a manager, captain, clerk, and purser, and no one to dictate to them in any one thing.

I hope the remarks which "Adventurer" and myself have made about the mine will go some way towards having a good man at the helm, should it start, and I hope it will. A good property never ought to stop idle. As far as the prism of copper being so rich, and also so easy coming to and from the mine, I consider it is a most valuable property whoever works it.

Wadebridge, Sept. 18.

J. W. P.

#### PAWTON IRON MINE, AND THOS. PARKYN.

SIR.—In the Supplement to the Journal of Sept. 7 Mr. Parkyn hints at many things, but I think fails to account for his sweeping remarks of Aug. 10. He thinks I shall be illuminated, and am not sincere. Will you kindly afford me space to say, although I have seen statements about iron ore where no lode could be found—about tin mines, lodes, and sets, which, if all had been true, would have yielded sufficient ore to break down many of our smelting-houses, and yet I am not illuminated. To convince Mr. Parkyn I am sincere I again repeat my offer, open to him or any other. Mr. Parkyn would have me think the four poor men were killed through the mismanagement of a navy—I presume he refers to Capt. Jennings. I meant Capt. Vivian, who went to the iron mines near Llantrisant, Wales. Of Jennings I know but little; but whether navy or miner, is he not equal to the present management? I am of opinion three-fourths of the accidents to our miners occur through their own carelessness and inability to perform their work. Does Mr. Parkyn know those men did not receive cautions from the navy captain? *Bona fide* mining would never be in danger but for the hundred and one nothings continually set before the public "gold painted." I said nothing about the starts, but I think the first start the most legitimate. I want to know Mr. Parkyn's reasons for saying the proprietors are sure of success, and unless he can give facts this statement should not have been made.—Sept. 18.

HEMATITE ORE.

#### THE HARLEIGH SILVER-LEAD, COPPER, ZINC, AND SULPHUR MINING COMPANY.

SIR.—The above company was brought out in the early part of 1871, and according to the prospectus was then a paying property, only time being required to erect more extensive dressing machinery, when increased dividends could with certainty be relied upon. The capital was (the managing director stated) all subscribed, the shares quoted at a premium—everything, in fact, seemed prosperous and satisfactory; but what is the state of affairs now, after the lapse of nearly two years? Not a line is to be seen in your columns, not a single report has appeared for months past, the name of the company is omitted from your list, and the time for the usual annual meeting considerably overdue. I have written to the secretary, and also made personal application at the office, but not a jot of information could I obtain. Altogether it is a most unsatisfactory affair, and something ought to be done to clear up the matter; and I should be glad to co-operate with my fellow-shareholders in the endeavour to obtain a thorough investigation.

Nottingham, Sept. 16.

E. SMITHURST.

#### CIRCULAR MINING—GLAIN PEDDOR.

SIR.—I have received numerous communications from shareholders in this most unfortunate speculation, and from their tenor I am led to believe that they thoroughly endorse my views, and believe with me that measures must be taken at once to extricate the mine from the evil hands into which it has fallen.

The *modus operandi* of E. Brewis and Co. seems to have been with more or less variations, according to circumstances, as follows:—As shown by formal evidence, Brewis had amongst other agents (say, accomplices) in Fenchurch-street, styling himself McEwen and Co., and a second in Bush-lane, of the name of Bell, with the usual addition of Co. Circulars by the hundred were then dispersed, ostensibly separate and independent, but actually issuing from Brewis as head centre. Among numerous instances which have come under my notice I will mention two as illustrating the usual mode of procedure. In the one instance a gentleman, having bought one Glain Peddor share of Brewis for 30s., was induced later to buy one more of Bell for 30s. In the other case Brewis having prepared the ground, with prospectus and reports all highly seasoned, and quoting the shares above par, supposing the quarry was not brought to ground, Bell came forward, asked 30s. per share, and got it. It has been well said by an eminent legal authority that Brewis, having determined to play "sharp," did it thoroughly.

It may seem strange to many that people can be found to part with their money so easily; it appears, indeed, culpably negligent, but the connoisseurs of private circulars know that the work is comparatively easy and very profitable. As, however, this system—carried on in most instances by obscure people, grossly ignorant of mining—seriously damages legitimate business in mines, in disgusting *bona fide* investors, and bringing the whole business into disrepute, it behoves all who have the welfare of British mining at heart, to warn the public against listening too readily to the advice of circular propagandists.

You, Sir, on more than one occasion have readily opened your pages to the exposure of this evil, and I think with good effect.

4, Birch-lane, E.C.

FERDINAND R. KIRK.

#### GLAIN PEDDOR MINING COMPANY.

SIR.—I beg to inform those interested in this company that all work at the mine was stopped last May, and still there is nothing doing. The late secretary was Mr. James Weatherley, the present, Mr. John Davall, of King's Arms-yard, Moorgate-street. The lease of the mine was, I believe, never transferred from Mr. Brewis to the company. As to the formation of the company and price of shares I can offer no information; but shall be happy at any time to give every information as to the local position and prospects of the company's property, which has been inspected by two practical and independent mining men—one for the directors, the other for a shareholder.—Wade.

D. R.

#### GLAIN PEDDOR MINING COMPANY.

SIR.—Let "W. E." apply at 104, King's Arms-yard, Moorgate-street, for information relative to the above company, where he will find the present secretary. I consider it a great pity that a mine with such good prospects should be idle, and I would recommend that the work so ably begun should be completed, when, from the promising nature of the lodes, the probability is that a paying mine will be opened up.—Aberystwith.

D. R.

#### WEST CHIVERTON.

SIR.—As a meeting of this company is to be held forthwith, and as there is much to examine and look into, it is very important and incumbent on the part of shareholders to attend the meeting, then and there to satisfy themselves as to the true state of our affairs—What prospect have we of a new lease, and what premiums? What is now owing, and how much is omitted to be charged in land damages, rents unpaid, dues, &c.? The question of costs for seven or eight steam-engines is alarming—it is said 600s. per month. Can this possibly be economy in machinery? Shareholders, attend to your own interest at once, examine the books and accounts, and consequently the property, &c. &c. Is it not known in the West that some of the executive are not on good terms with the local agents and other members of influence?—a serious bar to a new lease. There may be other South Wales than one, therefore we must look to our own interest forthwith.

A SHAREHOLDER AND WELL-WISHER TO LEGITIMATE MINING.

#### DON PEDRO NORTH DEL REY GOLD MINE.

SIR.—*Apocrypha* a letter on the above concern in the Supplement to last week's Journal, allow me to add a few remarks to further show the lamentable state into which affairs are drifting at this mine. Your correspondent informs us that 12 months at least must elapse before the pumping machinery can be set to work; but permit me to ask if he has the least assurance that it will then effectually drain the mine? For one beg to express my very grave doubts on this point, and after much enquiry into the manner and position in which it is at present being erected, have come to the decision that it cannot possibly work without considerable interruptions, and, consequently, will never perform successfully the purpose for which it is being constructed, if, indeed, our present manager of the works is capable of ever bringing it to that very desirable condition. One thing is certain, that in his former chief capacity he entirely gutted the mine above water, without making the least attempt to lay open further auriferous ground, which we clearly indicate any plans for carrying out this somewhat difficult matter, is further proved by the fact of his resigning at such a critical period, and then making the most notorious statement of his ability to increase the returns, to obtain the position again, after he supposed the thing was so far carried out as to allow of his being able to go in at the finish and get the credit; but if his ability may be judged from his veracity we have, I fear, but little to expect from this gentleman.

To me there is something very mysterious about the whole matter, why were not the works inspected by someone before the former executive were dismissed, and proof positive obtained that the best was not being done for the shareholders? And can we suppose that the directors were ignorant of the state of the mine when the present chief captain was appointed, that they should have selected the man upon his own statements, and to have lavished our money upon him in the way they have done, shows very great want of discretion on the part of the officials in Moorgate-street.—Twiss, Cornwall, Sept. 18.

ONE INTERESTED.

#### THE FLAGSTAFF MINE—LITTLE COTTONWOOD.

SIR.—I see Mr. F. Bennett has mentioned my name in connection with the above mine. I was in treaty for it in July, 1871, and proposed it to some friends of mine in London; the price at that time was 40,000s., and 12,000s. for the furnaces. Messrs. Bateman and Buel first proposed the mine and furnaces to me, and I should have bought the mine, but my London friends hesitated too long, and would not take it but by the long route of sending a report to London; meanwhile, it was sought after with great avidity, and thus lost a valuable property, selling at that time for a most insignificant price compared to its market value at present of 450,000s. They are to be forgiven, for they did not know then what they were losing.

Salt Lake City, Aug. 20.

HENRY SEWELL.

#### THE UTAH MINING COMPANY.

SIR.—There is an excellent letter in the Supplement to last week's Journal from "W. K. S. M.," on the Richmond Consolidated Mining Company. Will you allow me to draw the attention of the directors and shareholders of the Utah Mining Company to the same in your next issue, for, with the exception of a word or two in it, the facts stated would apply exactly to that company. The Utah Company has been in existence about fifteen months. It came out under the best mining auspices, and the 10s. shares have actually run up to 22s.; they now stand about 2s. per share, I believe myself solely from bad management from the first. It would take up too much of your space to describe the apparently reckless waste of money in various ways— suffice it to say that the shareholders know it to be so. When the present Mr. Murphy was appointed sole manager of the mines, at something like an income of 3000s. a year, we were informed by the directors that all difficulties would cease, and a long course of prosperity would ensue; but the only facts yet arrived at are that Mr. Murphy, whilst expending two-thirds of the profits of the mine in expenses, writes from time to time—"Evening" in a most promising condition for a great success in the future." This may be so, but while two-thirds of the profits are expended in obtaining the ore I, for one, am credulous as to the future, and I think it high time that the shareholders should consider whether or not it is advisable to appoint some able man to assist Mr. Murphy in his endeavours to make the mine pay, which he was so sanguine of accomplishing if only left to be sole manager, but which hitherto he has so signally failed in doing.

Will you kindly allow this to appear in this week's Journal, as I have no other means of communicating with my fellow-shareholders.

ONE INTERESTED IN BOTH MINES.

[For remainder of Original Correspondence see to-day's Journal.]

### Meetings of Mining Companies.

#### BRADDA MINING COMPANY.

The half-yearly general meeting of shareholders was held at the Royal Hotel, Douglas, on September 12. Mr. G. W. DUMBELL, banker, Chairman of the directors, presided, and there were also present Dr. Montford, Dr. Anderton, Messrs. James Spittal, L. G. Howard, H. Whiteside, C. Cleator, J. Lee, G. Sherwood, P. Bridson (secretary), Captain Baskell, &c. The notice convening the meeting was read. From it it appeared that the business comprised the election of two directors and an auditor, and that a summary of the accounts for the half-year, together with the directors' and manager's reports, would be laid before the meeting.

Mr. LEE asked how it was that a statement of the accounts had not been forwarded to the shareholders at least ten days before the meeting, as provided in the Deed of Association?

The CHAIRMAN said that perhaps it had been overlooked. He was glad that the subject had been mentioned, so that it might be looked to in future, when, perhaps, it would be better worth their while to issue a balance-sheet.

Mr. LEE: But we like to see it, such as it is.

The SECRETARY explained that to bring out the balance-sheet at the meeting required only three days for auditing the accounts.

The CHAIRMAN considered that that would be long enough, the accounts not being very large. According to the Deed of Association they could make them up to any time three months back, but there was no occasion for that. They might make them up to any time one month back, and that would give them ample time for preparing the accounts, and having them audited and distributed amongst the shareholders.

The subject was then dropped, and the following Directors Report was read:—The directors have no particular information to give the shareholders, beyond that contained in Capt. Baskell's report, from which it appears that steady progress has been made, and is still continued, in carrying on the works at the mine according to the course laid down by Capt. R. W. Rickard in his report after inspecting the mine. The directors would remind the shareholders that the following statement appears in Capt. Rickard's report:—"In conclusion, I do not hesitate to affirm that there are few speculations in mining that promise so favourably to become a great success as Bradda Mine; and it only requires a little patience on the part of the shareholders, and perseverance in carrying out the best plan in developing the mine, to reach, before very long, the fruitful period of its history." These hopes are confirmed by Capt. Baskell, manager of the mine, and the directors are, therefore, justified in believing that they will be realised.

The CHAIRMAN, after calling particular attention to the quotation in the directors' report from Captain Rickard's report, said: You will perceive, gentlemen, that the directors have not a very extensive report to make. Indeed, there is no need for it, the whole history of the mine being contained in the manager's report. He tells you what has been done, the probable result of it, and the appearances met in carrying out the development of the mine as recommended by Capt. Rickard; and it appears very probable that before over long we shall arrive at what Capt. Rickard points out. We have open ground, and considerable lodes, from which a large quantity of water is issuing. When you break through a shell of this kind, and meet with large quantities of water, it is indicative that you are approaching a lode of some importance, whether bearing mineral or not. This is an open lode; not merely a lode defined between two cheeks, and filled with the country rock, but an open lode from which the water issues. The manager's report appears to me to be a very satisfactory one. The accounts, which have been audited by Mr. Haining, shows that the balance passed at the last general meeting, held on May 27, was 22,137. 17s. 3d.; since then we have received 41s. 10d. for old iron sold, and interest on calls 44s. 12s. 11d. The stock of ore at Bradda is valued at 377s.; from which must be deducted 40s. for ore credited in last balance-sheet, making a total of 239s. 19s. The labour cost for the six months has been 971s. 3s. 3d.; merchants' bills, 657s. 7s. 10d.; office expenses, 65s. 14s.; and royalty, 13s.; leaving a balance of 594s. 13s. 11d. The account also contains a list of the liabilities and assets, which shows that the amount of unpaid calls is 715s. This, however, bears interest at 5 per cent. It is much more advantageous to us to have our money out at this rate of interest than to have it in the bank bearing small interest. The money is out bearing good interest, and we can get it in as we want it. I beg to move that the accounts be received and passed, and that the reports, along with the accounts, be printed and forwarded to each shareholder.

Mr. L. G. HOWARD seconded the motion.

The CHAIRMAN: I suppose we may expect another call very soon?

The CHAIRMAN: We may anticipate something of the sort when the present resources are exhausted.

Mr. SHERWOOD: The 500s. or 600s. we have in hand will not go very far.

Mr. L. G. HOWARD: Does that 594s. balance in hand take into account the unpaid calls?—The CHAIRMAN: It does.

Mr. SHERWOOD: Have you any ore at surface for sale?—The CHAIRMAN: We have 377s. worth at surface; but that is taken into account.

Mr. WHITEHEAD: There is, in fact, nothing in hand except the 36s. you have at banker's?—The CHAIRMAN: I should suppose you will have to make a call soon.

Mr. SPITALL: You have 600s. to 700s. to go on with.

The CHAIRMAN: The 700s. in arrears is here brought forward as cash. If we want money we send notice out calling in the unpaid calls to the amount we require; for instance, there are 700s. due in merchants' bills, which the directors went through yesterday, and ordered to be paid.

Mr. WHITEHEAD: How many calls have yet to be made?—The CHAIRMAN: Three, of 5s. each. Then there will be 3s. paid-up.

The motion for the adoption, printing, and circulation of the accounts, &c., was then carried unanimously.

The meeting then proceeded to the election of directors and auditor. Messrs. G. W. Dumbell and W. F. Moore were unanimously re-elected as directors; and Mr. Haining was re-appointed auditor.

The proceedings terminated with the usual votes of thanks.

#### EAST NANT-Y-MWYN LEAD MINING COMPANY.

The statutory general meeting of the shareholders was held at the Royal Hotel, College Green, Bristol, on Monday.

Major CASTLE, J.P., in the chair.

Mr. G. H. BOWYER (the secretary) read the notice convening the meeting.

The CHAIRMAN said the present was a mere formal meeting, and there was little or nothing to be done. It was held pursuant with the provisions of the Companies Act, which rendered it necessary to call the shareholders together within four months of the registration of the company. They had a report from Mr. Trevithick, the manager, which the secretary would read, and then shareholders could ask any question upon it, or respecting the present state of the mine. He hoped they should meet again six months hence, and that then the directors would have something more satisfactory to tell them.

Mr. G. H. BOWYER then read the report of the manager, as follows:—*Sept. 13.*—You are aware that this mine was worked some years since in conjunction with the Nant-y-Brain Mine, now at work adjoining us, and abandoned for want of capital. During that time a shaft was sunk in our set 26 fathoms below the surface, and at that point it intersected our No. 6 red lode. They drove their level several fathoms west on the course of the lode, where they discovered lead ore of good quality, and several tons were broken, dressed, and sent to market from the back of this level. The best of the ore, we are told from men who worked there, is going down in the bottom of the 26 fathom level; they sunk on it a short distance until obliged to abandon it in consequence of water, and they say the shaft of ore appeared to be widening and lengthening as they sunk on it in the bottom of the 26 fathom level. The set of shaft is in a good condition; it is a good sized one, suitable for taking our pitwork, and we are now laying out and providing for putting our pumping gear to work on this shaft to pump the water, which will enable us to prove the ore ground in this level, and it is intended to sink 24 fms. below the 26 fms. level, which we consider will give our No. 6 lode a good trial at that depth, and see what the present shoot of ore will make in depth; and in the 50 fms. level it is intended to put out a cross-cut to intersect our No. 5 lode, which may be considered our main lode, as it is very large, and in the great Nant-y-Mwyn Mine, west of us, it has proved to be exceedingly rich, for it is said for the last 100 years it has been paying very large dividends, and is still paying well. We are not so far on with our work as I could wish; the delay, to a great extent, has been through so much rain, and for the want of hands, men being not only scarce, but dear. However, we have succeeded after some difficulty in getting a good foundation for our wheel-pit, and we have now completed the masonry work, and the wall-plates are on the mine. We have also excavated our bob-pit near the shaft, and we have also prepared for our stands to carry the flat rods from the wheel to the shaft, and we have cleared out and laid the foundation to receive a wood and iron house, which we have had built by Messrs. Brook and Bruce, of Bristol; it is now at the Llantrisant Railway station, awaiting haulers to take it to the mine, and in the course of a few days we hope to have it there. The timber for launders to carry the water to and over the wheel, as well as timber for rod-stands and main-rods for our pumping gear, are bought, and are also at Llantrisant Station on their way to the mine. Our horse-whim is in progress, and will very soon, I hope, be made up. We have a new whim rope from Messrs. Terrell and Sons, of Bristol. The Tucking Mill Foundry Company, who are making their best for us to have it all completed on Aug. 23 that they would do so I hope soon we shall have our pumping machinery at work, and shortly afterwards it is hoped to be able to give a favourable report of the state of ore spoken of.—R. TREVITHICK.

The CHAIRMAN said Mr. Trevithick was present, and would give any explanation wished, and the directors, so long as they continued such, would give any information in their power. It remained with the meeting either to adopt Mr. Trevithick's report, or make any enquiries upon it.

Mr. HAINING asked whether the lodes in the Old Nant-y-Mwyn Mine? If such was the case, there was every chance of their having a good property.

Mr. TREVITHICK said they could trace the lodes from the boundary to the Old Nant-y-Mwyn Mines. He had no doubt about their being the same lodes, and the manager of the old mine was of the same opinion. As to the quality of the lead, the best examination he could give was that he had sent some boxes to the manager of the Old Nant-y-Mwyn Mine, and that he did not know one from the other. He had that in writing.

Some samples of the lead ore were produced, and were examined with much interest by the shareholders.

Mr. HAINING asked what was the percentage per ton?—Mr. TREVITHICK said he did not know. There was not much silver. It was worth from 12s. to 14s. per cwt.—The SECRETARY said that according to Messrs. Johnson, Matthey, and Co.'s report there was 84 per cent. of lead and 5 ozs. of silver to the ton of ore.

Mr. HUTCHINGS asked whether, looking at the high price of coal, they had sufficient water-power to work the mines without the aid of steam-power? Mr. TREVITHICK said they would not require any steam-power. They had plenty of water-power to work the mine properly, unless there should be an extraordinary influx of water into the workings. He was perfectly satisfied they had sufficient water, and to spare. He (Mr. Trevithick), in reply to further enquiries, stated that there was not much water now. The lead could be seen on the surface.

The CHAIRMAN said Mr. Trevithick was a gentleman in whom the directors had the greatest confidence. He would not like to say that no more shares would be issued; 14,798 had been issued, including the 6000 to the vendors. The 150 shares had been applied for last week, and the directors did not feel justified in refusing an offer. He would not conceal from the shareholders that they were about to make a call immediately, and the larger the number of shareholders, the less the individual call. Mr. Fox, their solicitor, reminded him that the shareholders had a right to increase their investment, and if there was a pressure he should certainly vote for their having the preference.

Mr. HAINING thought an opportunity should be given to the existing shareholders of securing the preference.

The CHAIRMAN said he would pledge himself that no material increase in the shares be made without communicating to the general body of shareholders, and giving them the chance to come in and make application. Further, he would say that on any great improvement taking place in the mine the directors would issue a circular to the proprietors and inform them of it; he could not say more, as the undertaking was a speculation at present.

Mr. HAINING asked if an advertisement in the papers would not do better? The CHAIRMAN said he would rather keep it among themselves if they had a good thing. He moved the acceptance by the meeting of Mr. Trevithick's report.

Mr. HILL seconded the motion, and it was carried unanimously.

The directors having tendered their resignation, the CHAIRMAN said the work had hitherto been done by himself and Mr. Tyne, assisted by Mr. Pigott. Mr. Dunsford had been unable to attend the meeting, and was not desirous of being re-elected. On the motion of Mr. PAYNE, seconded by Mr. HAINING, Major Castle, Messrs. H. Tyne, and E. F. T. Pigott were re-elected directors; and on the motion of Mr. TREVITHICK, seconded by Mr. BOLLING, Mr. G. F. Fox was elected to fill the vacancy caused by the retirement of Mr. Dunsford.

Mr. Fox acknowledged the honour done him, and said he did not think his being their solicitor would clash with the office of director, especially as most of their legal business was finished. (Hear, hear.)

Mr. G. T. Tricks was re-elected auditor, after which the CHAIRMAN announced that the call about to be made would be 2s. 6d. per share. They could not go on without money, and he hoped that at their meeting in February the directors would have something to report.

A vote of thanks to the Chairman and directors terminated the proceedings.

#### TINCROFT, AND CARN BREA MINES MEETING.

##### PROPOSED TESTIMONIAL TO CAPT. TEAGUE.

The quarterly meeting of the adventurers of Tincroft Mine was held on Monday morning at the mine.—Capt. TEAGUE in the chair. Amongst those present being Messrs. J. Wickett, A. Treglowen, F. W. Dabb, H. Climes, W. C. Wickett, John Holman, W. Hancock, J. Wayne, W. Sims, E. K. May, James Holman, J. Treseder, R. Rosewarne, J. Bennett, J. W. Wilkinson, W. Teague, jun., &c. The accounts, read from the chair, showed that the labour costs for the past three months amounted to 4449s.; merchants' bills, 2136s.; carriage, 119s.; dues, 716s.; vice-wardens' assessments, 19s.; total, 7441s. The credit account proved that 210 tons of black tin had been sold for 19,015s.; copper 40s.; extra carriage black tin, 36s.; total, 19,092s. The profits for the quarter were 11,651s. 7d., which, amalgamated with balance from the last meeting of 714s., brought up the total to 12,365s., making a dividend of 2s. 6d. per share. The merchants' bills, a heavy vote of thanks being unanimously accorded to Capt. Teague, that gentleman, in responding, alluded to the absence of the 2s. 6d. bonus which the shareholders were to have upon the last occasion. He told them now that they must not expect any bonus again until the stamps, which were just being laid down, were in working order. It was in consequence of that that they had to forego it upon this occasion.

A meeting of the Carn Brea Mines followed, there being quite as large an attendance as at the other, there being present, in addition to those mentioned above, Messrs. T. Milton, Southey, Woodward, T. B. Hall, W. H. Tregown, J. Kendall, &c. Capt. Teague stated that during the last three months the labour expenditure had been 5397s.; merchants' bills (a very serious item), 4744s.; carriage, 1416s.; dues, 621s.; Vice-Warden's assessment, 15s.; on account of new calculations, 100s.—the total expenditure being 11,651s. 7d. on these 115 tons of black tin had been sold, for which 13,675s. had been realised; 222½ tons of copper ores had fetched 1448s.; arsenic, 189s.; extra carriage black tin, 29s.; making a total of 15,330s. The profits for the three months had been 4275s., which, added to the last quarter's balance, made the whole sum an available balance of 9341s. The dividend would be 4s. per share. He alluded to the promising condition of the various lodes, but remarked that there were several points, which were valued at 10s. or 12s. per fathom, which would prove rather expensive to explore, from the fact of their being so hard, and the price of labour so high, thus making the report "flashier" than one really warranted. The merchants' bills, he regretted to say, formed a very serious item, and for two at least out of the three months they had to pay rather heavily. Previously, they had a contract which ran at the end of rather beginning of April, and then they were supplied with a not very first class kind of coal, so poor in fact that occasionally great difficulty was found in getting the engines to work with it. For this they were charged 21s. per ton, and of course they would have to pay for it. It must also have struck the gentlemen that all this work was not done for nothing, and in addition they owed 800s. for an engine. He then submitted to the meeting a resolution to the effect that the accounts be allowed, and the report printed for circulation. Also that a dividend of 4s. per share be declared. These resolutions having been carried unanimously.

AN ADVENTURER enquired the necessity of keeping in hand so large a balance as proposed.—Capt. TEAGUE: Suppose we had an engine to blow up?

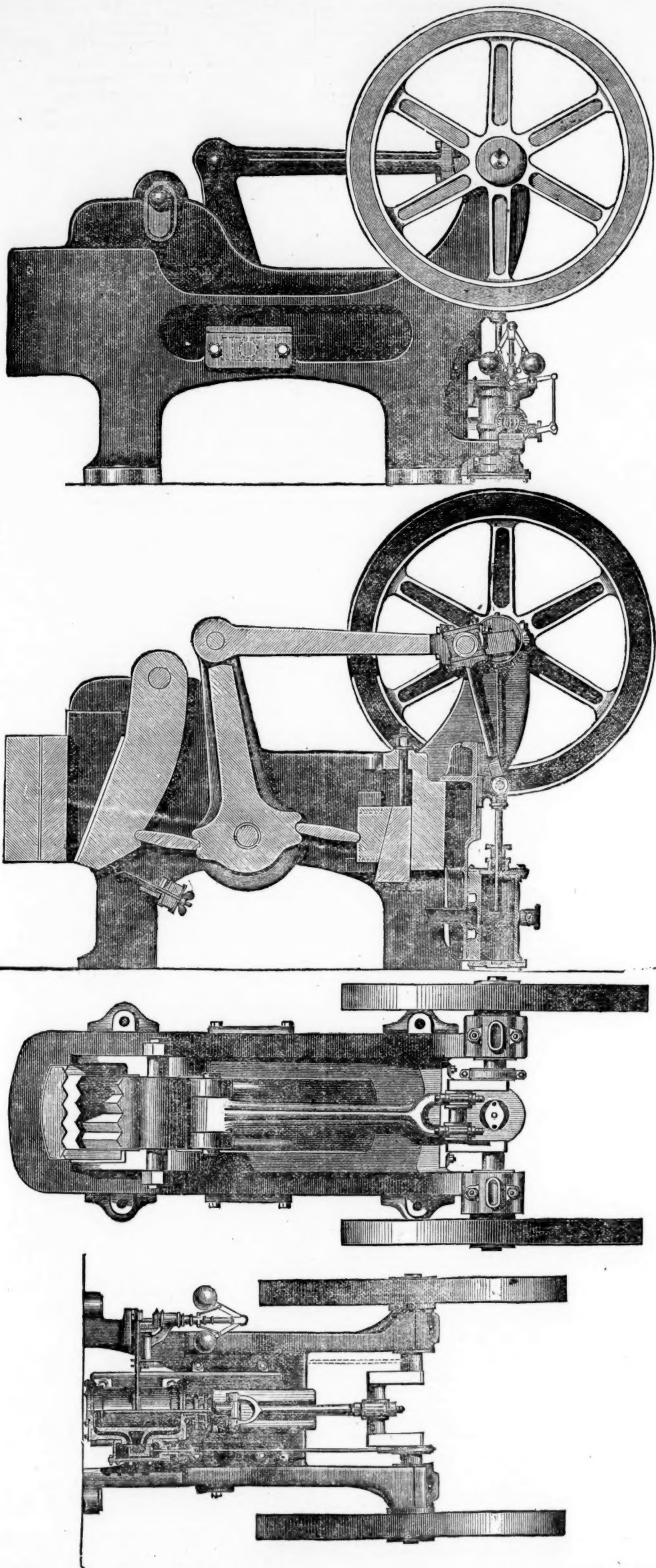
Mr. WICKETT gave notice that at the next meeting he intended to bring forward for their consideration a proposition to present to Capt. Teague a testimonial in recognition of the very able services in connection with the mine, which from a wreck he had brought into the most flourishing condition. He hoped they would think well over it, for if ever a gentleman's efforts demanded the most substantial recognition Capt. Teague's surely did.—Mr. KENDALL, seeing the encouraging nature of the accounts, and bearing in mind similar previous profitable returns, and remembering through whose instrumentality those accounts and returns were made, moved a cordial vote of thanks to Capt. Teague.

This having passed amidst cheers, Capt. TEAGUE acknowledged the compliment, being extremely pleased to be able to meet the adventurers under present circumstances. He and the agents had had pretty much to do to bring Carn Brea to its present position, and they had done it to the best of their ability. It was certainly true that when he first took the mine in hand it was not in a very flourishing condition. When he first came there the floors were in a very bad state, but these had been since thoroughly renovated, but floors, although a capital thing, were of no advantage without tin, which they certainly had: 150 tons of tin were not so bad to be taken out of an old wreck of a mine, especially when they considered that the alterations were still being pressed forward and the returns not in the least retarded. With regard to the projected testimonial, he cautioned them not to present in haste to repent at leisure. When commencing his work with the mine he feared the consequences: if he had failed, he would no doubt have been sent away with a flea in his ear. He knew well the nature of some of the gentlemen assembled, but whatever he had done he had done the best he could. Whether he had an interest in the largest or smallest speculation he had always endeavoured to get at the bottom of the thing. Some persons were fully capable to skim over the surface, but he had been oftentimes informed that the big nuggets were always to be found at the bottom, and knowing, as he did, that heavy metal sunk, he had always looked to the bottom to find it. With regard to their future prospects, the all-important question to the shareholders was, he supposed, whether by the next quarter a call would be made upon them or not. Well, if they buoyed themselves up with hopes that they would have some dividends, from present appearances he did not believe that they would be disappointed. Reports had lately been circulated that in New South Wales there were mountains of tin, but unfortunately these mountains of tin could not be reached. He hoped that these mountains would be reached, but he had been oftentimes informed that the big nuggets were always to be found at the bottom, and knowing, as he did, that heavy metal sunk, he had always looked to the bottom to find it. With regard to their future prospects, the all-important question to the shareholders was, he supposed, whether by the next quarter a call would be made upon them or not. Well, if they buoyed themselves up with hopes that they would have some dividends, from present appearances he did not believe that they would be disappointed. Reports had lately been circulated that in New South Wales there were mountains of tin, but unfortunately these mountains of tin could not be reached. 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# MARSDEN'S STEAM-CRUSHING MACHINE FOR MINING PURPOSES

By MR. H. R. MARSDEN, SOHO FOUNDRY, LEEDS.



We beg to call the attention of our mining friends to the above illustrations of a new machine for crushing ores, minerals, rocks, or other hard substances requiring to be reduced to fine gravel. The principle of the Blake machine, now so well known, is adhered to, but it has been greatly modified, improved, and extended. The machine is so amply illustrated that little description is necessary to make the drawings clear.

The three chief features of improvement are—1. An improved toggle motion, which operates through a vertical vibratory lever rocking on a central pin, which has its bearings in sliding blocks

one on each side of the main frame, these being free to move horizontally. The lower end of this lever is notched out to receive one end of each toggle bar, the opposite ends resting in notches, one at the back, which is adjusted by the wedge movement, an extremely simple contrivance for altering the size of opening at the bottom of the jaw, and so regulating the size of material broken. The other end rests against the moveable jaw, which is actuated by the rocking lever. It is here that an entirely new principle is involved. The lever assumes three positions for each half revolution of the crank-shaft, or for each complete revolution the lever has passed and re-

passed its vertical line, placing the toggles also twice in a horizontal position, and thus giving two distinct crushes for each revolution of the crank-shaft.

This has been frequently done before with the old Blake toggle motion, but there was always found a want of power to do this effectually, the whole weight of the connecting-rod and toggles being to lift passed the centre, causing an unsteady motion. In the above machine the lever is perfectly balanced on its centre, the friction of the parts reduced to a minimum; the leverage gained, too, is considerable, whilst the whole power of the engine is utilised by being coupled direct, which constitutes the second improvement. This consists simply of a cylinder, piston, slide-block, and guide, also governor gear. The engine crank shaft is also made available for driving the machine.

The third improvement is a new form of jaw, especially employed for making cubical pieces without dust. This we intend to illustrate at some future time. We may take this opportunity of stating that the new cubing jaw received the silver medal at the late Royal Agricultural Society's show at Cardiff, and its work universally admired. The whole machine is well designed, simple but substantially made, extremely easy in its working, and capable of doing at least one-half more work per day than the old Blake machine. It is especially adapted for crushing or grinding purposes, and is capable of reducing any material to fine gravel, such as copper, tin, or other ores, and is certainly preferable to the stamps in use for that purpose. A small hand-machine was also made and exhibited at the Royal show, to test the difference between the old and new principle in point of power required, and many who tried it at Cardiff can testify to the ease with which it will reduce 3-inch boulder stone to fine gravel. Mr. Marsden is kept fully employed in executing orders for these machines both for the home and export trade.

## Royal School of Mines, Gernymn Street.

[FROM NOTES BY OUR OWN REPORTER.]

LECTURE LI.—I come to-day (said Mr. SMYTH) to one of the most important subjects affecting mining—that of ventilation—a subject in which scientific considerations enter so largely as to become almost the basis of it, and on which we shall require to occupy ourselves for at least half a dozen lectures. It is by no means a new subject, and you have only to cast your eyes over that old mining work to which I have so often referred, written by Agricola, to see how, two centuries ago, it was regarded with great anxiety and interest. The history of ventilation in mines extends from the rudest and simplest contrivances, whether in metalliferous mines or in collieries—from the men beating or “dusting” the gas out of their working places with their jackets (as shown by Agricola, and which in stagnant places, or where gas oozes out in moderate degrees, would enable the men to go on with their work), up to the most elaborate and extensive systems by which large volumes of air, to the extent of 150,000 cubic feet or more per minute, are passed through many miles of underground tunnelling. Other diagrams in Agricola's book show the miners extracting the foul air by a water-wheel, and in another case by a large fan; and I only mention these to remind you that mechanical, though simple, means have been in vogue for centuries past, and that such means have long been known to miners in every country in Europe. The necessity for ventilation is obvious, for although mining be on the smallest scale, it is everywhere found impossible for men to drive for many fathoms without their being made painfully aware of the fact that they are stopped absolutely by the stagnation and vitiation of the air they have to breathe.

Stagnation is produced by the absence of anything like a draught, but the vitiation of the atmosphere in mines arises from many causes, and is of different kinds. First, we may mention the increased temperature resulting from stagnation, which assists ventilation rather than otherwise, but which in ascending workings gives rise to difficulty. Then, in some mines the humidity of the air is considerable. The greatest cause of vitiation, however, is that produced by the breathing of the men and horses (where the latter are employed), the burning of lights, and the smoke therefrom. In dry mines the dust from the coal thickens the air in a serious manner, and since the introduction of gunpowder on a large scale the smoke and dust arising from explosions are ever present. Besides these, which may be called mechanical deteriorations, those which arise from the chemical changes which take place in the rocks themselves are not to be disregarded. I believe, however, that they have hitherto been much underrated. I believe that most of the rocks when cut through have the power of abstracting oxygen from the ordinary atmospheric air to a considerable extent. There are besides emanations of carbonic acid gas, of fire-damp, and of a few other gases which, although deadly, are much more rare. The ventilation, therefore, which a mine requires may at different seasons be different, and certainly in the cases of different mines fresh air will require to be introduced, in different degrees indeed. Thus, what would in some places leave a mine in a dangerous state would in another render it completely safe. What, therefore, is done by way of ventilation must be governed by the specialities of each case. For instance, there is a remarkable difference in the requirements for ventilation between metalliferous mines and collieries, even if we view them irrespective of the emanations of fire-damp which prevail in the latter. In the one case there is a single shaft by which the air is carried down, and then it has to be conducted through a series of interminable passages and ramifications many miles in length, until it reaches the upcast shaft; and it is obvious that what is wanted is not only to introduce sufficient fresh air, but to make it travel through all the levels and working places in which, as a rule, large numbers of men are employed. A metalliferous mine, on the other hand, has a number of shafts, down which the air makes its way, and finds an exit by others; and if the summits of the shafts are at different heights at the surface—that is to say, some on a hill and others in a valley—there will be a considerable amount of air naturally passed through the main passages, and, perhaps, artificial ventilation will only be required for what are termed “close ends.” In these places probably only one or two men would be employed and affected by the stagnation of the air, while all the rest of the mine might be enjoying good ventilation. The contrivances used to meet such cases are generally being driven right through, good ventilation follows. In nearly all metalliferous mines a good deal of trust is placed in the numerous openings up to the surface which exist, and the abundance of spontaneous ventilation produced thereby. Indeed, there are mines in which there is no mechanical ventilation whatever, and but little management of the currents of air is requisite. In such cases the workmen are few, and they enjoy a pleasant immunity from the exhalation of noxious gases, or from watery and other vapours.

We will now consider briefly the various sources of difficulty which arise to impede the miner as he prosecutes his work, whether he is excavating vertically or horizontally; and amongst these the presence of noxious gases is the most formidable. We are all familiar with what constitutes bad and unwholesome air both in public and private buildings, but many of the same conditions occur in mines in a highly intensified degree. For a very admirable account of these gases I may refer you to the carefully-prepared report of Dr. Angus Smith (the eminent chemist of Manchester) to the Royal Commission which sat some years ago on Metalliferous Mines. He states that in a thoroughly wholesome atmospheric air the constituents should be divided as follows:—Oxygen, 20.95; nitrogen, 79.0; carbonic acid, .04. In many mines, however (80 per cent. of those he examined) he found that there was frequently only 19 parts of oxygen, but if it fell below that the lights would grow dim, and it became what the miners call “bad air.” In many of these cases the percentage of carbonic acid gas was much higher, and was then most injurious to the health of the men, producing violent and continued headaches. The deleterious gases, however, present in mines vary considerably in their specific gravity; and if we take the whole contents of a level, and consider them present in it, they will arrange themselves as follows:—First, there will be water running along the bottom; then carbonic acid gas, with the low specific gravity, as compared with the air, of 1.524; next, sulphuretted hydrogen, slightly heavier than the air; and then the ordinary atmospheric air. Above that would be carbonic oxide (0.970); and then carburetted hydrogen, the lightest of these gases, with a specific gravity of only 0.555. Thus, while the lower part of the drift would be occupied by carbonic acid, or as it is called by the miners “choke damp,” the upper part would be filled with carburetted hydrogen, or “fire damp.”

I may mention in passing that the miners designate all these gases by the word “damp”—black damp, white damp, choke damp, fire damp, peablossom damp, globe damp, and so on—many of them being fanciful or local names for the same kind of gas. A knowledge of these facts is most important, because all the lighter gases will be found to have a tendency to rise into all the working places above the level. If the workings, therefore, be “uphill” from the level, the miners must be on their guard against fire-damp; if below the level, against choke damp, or carbonic acid gas. If in getting a bed of coal the workings proceed systematically down hill, the lighter gases will rise, and so constantly leave the face of the working clear; but the very reverse will happen if the workings are uphill, and there will be great difficulty in getting the dangerous gas away. It must, however, be remembered also that the division of the gases I have spoken of takes place slowly, and combinations are frequent. In dealing with what he very justly calls “bad air”—that is, air deprived of part of its oxygen, while it contains a larger proportion than it ought of carbonic acid—the miner has certain practical rules for his guidance. For instance, if he approaches a body of carbonic acid his candle will show a tendency to go out; but this indication varies in different classes of bad air, and is affected by the state of the weather. In some cases the lights will go out without warning, and in others they will burn so very badly that they have to be held horizontally, or two of the candles must be held together. The miners have a common belief that where a candle will burn they are secure, but they are still exposed to the deleterious state of the atmosphere produced by a large proportion of carbonic acid, to the great injury of their constitutions; and if you refer to Dr. Smith's report you will find some remarkable instances on that point. This sort of bad air will be found most frequently in old workings, where there is always a great deal of chemical decomposition going on. These chemical changes have also another effect in some rocks prejudicial to ventilation. If the openings are large the same current will ventilate a greater distance in length than in small openings. In dark-grey slate, every edge and corner of which will be coated with sulphates. This goes on to an enormous extent in some mines, and therewith a great deal of heat, promoting decay and change, particularly in organic substances, such as timber, which is coated with fungi, withdrawing the oxygen from the atmosphere, and assisting in the general deterioration of the air. With respect to car-



**TAGUIRIL.**—Capt. W. H. Martin reports for July: Owing to an improvement in the vein which occurred on July 29 at the junction of lodes sinking below the 25, west of Haymen's shaft, the result of the month's working shows an increase in the produce compared with that of last month; some good quality work has been extracted. The lode presents good indications for further improvements. The dip of the gold vein inclines west, in which direction the ground is of a soft nature. The produce amounts to 390 oits. For the first division of August it is reported that the work, which is considerable locally, are performing a fair amount of lodes below the 25, west of Haymen's shaft, extending on the line of No. 1 lode to the deep adit, and cross-cutting north from Natives' crosscut. The lode and gold-bearing vein in the stope referred to above have an improved appearance, but during the first ten days in the month it yielded no box work, since when some fair quality work has been extracted going west, but it is very bumpy and fluctuating in yield. In the deep adit extending east from No. 2 cross-cut on No. 1 lode, there is also an improvement in the character of the lode (composition clay-slate, manganese, and iron), during the last few days samples showing gold in the batea have been taken. He proposes raising some tons of it through stamps, to give it a fair trial. Then



is no lode intersected in the cross-cut going north; occasionally some small veins of clay-slate are met with dividing the sandstone. By the Monro de St. Anna gold mine, which was left on July 12, he forwarded for delivery to Messrs. John Moore and Company, Rio de Janeiro, a box containing 562 oits. of gold dust.

**Hudson.**—S. O. Brown, superintendent, Aug. 24: I proceeded to the mine to determine upon the selection of motive-power for the hoisting works, and to make a careful examination with the assistance of a surveyor, I decided upon the use of water-power. This will make the running expense about 50 per cent. less than if steam were used. I shall conduct the water through an 11-in. iron pipe, which will give all the power required for the hoisting works, and also for a 20-stamps mill. I estimate that \$5000 will be sufficient to put the mine in working. The mine appears very promising, the lode being well defined and extremely well located for working. I think within three months I can have the mine sufficiently developed to justify you in proceeding to then erect a mill, which could be completed within the three months following. With a mill erected immediately below the mine, and on an eminently favourable site, I have no doubt the ore could then be mined and milled for from \$3.50 to \$4 per ton.

**EMMA.**—Telegram from New York: 50 tons ore shipped per Bre-men, 50 tons ore shipped per Hermann, 80 tons ore shipped per Abyssinia.

Telegram from Salt Lake City, dated Sept. 16: Forwarded no ore this week to New York: 390 tons first-class ore raised this week; raised no second-class ore this week; 300 tons first-class ore at railway depot; 180 tons first-class ore raised at mine; sold 440 tons here; mine producing \$40,000 per week; product increasing.

**ALMADA AND TIRITO.**—The directors have received a telegram, dated Aug. 8, giving the net profit as 1337. This is rather less than last month, and is owing to the Indian labour leaving the mine for the annual holiday held in the neighbourhood this month. The mine continues as productive as before.

**ANGLO-ARGENTINE.**—The remittance of 954 ozs. of gold has arrived by Royal Mail steamer Douro. Advice from the mines, under date July 29, report the establishment at Guallian in perfect working order.

**CUABA.**—Advice from Brazil:—"The work has been continued where Mr. Meadows abandoned it. The lode in the Victoria Mine has been struck, and cut into about 3 feet; the stone extracted is the legitimate black stone of Cuaba of the Great Lode, and yields from 3 to 4 oitavas per ton." The negotiations are still pending as to the future working of the mines, and I trust in the course of a little while to have to make a favourable report as to their satisfactory termination.

**GOLD RUN.**—O. S. Kipp, superintendent, Aug. 26: I have paid \$4500 for the Sherman claim, including four tanks of quicksilver, full set of blacksmiths' and mining tools, and rig. I think it a profitable purchase, and consider it adds at least \$25,000 additional valuation to the Gold Run. The last run we were bothered considerably in various ways. We were working the 2d level not because we were obliged to do so, but I thought it good policy. The present run, 10 days in, will also be on the 2d level. It will pay you a dividend, but how much I cannot say.

**NORTH AMERICA.**—Mr. Morgan, Aug. 28: Our operations at the mine are progressing satisfactorily. We are not yet able to secure all the force of Chinese drifters desired, but we are doing quite well. I have engaged a further lot of good hands to go up from this city in a few days. The average number of men now employed amount to 68 (42 of whom are Chinese). The quality of gravel now being extracted is excellent. I made tests from each "breast" at last washing, and found the average near \$3 per load. The character of the deposit in the new tunnel, as we advance back into the mountain, is worthy of notice; it is a heavier sort of gravel than ever before met with in this or any mine in the neighbourhood. The gravel is in very coarse pieces. You may rely on a very large yield from the gravel now being taken out. The unusual flow of water from the background renders it necessary to open and cut it up as much as possible, which gives chance to dry it out. The Chinamen do not like to work where it is too wet, but we shall not require them to do so by having the ground drained. We may possibly have water for washing in November, but it is more certain in December. The labour of washing the gravel after it is in the yard is very rapidly carried on. One man to a pipe throwing 70 inches, miners' measure, of water being able to put 8 tons to 1000 bushels, 24 hours; hence the washing of 40,000 through from several small pipes can be employed, will not occupy a very long time. After water once starts in November or December we may expect a continuance all through the winter season, except, perhaps, for a short time in February or March. In regard to the delays and disappointments that have been met with since taking this property we have not been alone, others in this vicinity have suffered also. In our case I believe they are at an end. The monthly product of gravel at present will yield, washed, not less than \$20,000, while the actual cost of production will not exceed \$8000.

**PESTARENA UNITED.**—Thos. Roberts: Piedimulera: In the month of August we amalgamated with the large mills at Piedimulera establishment 533½ tons of ore, and with the small mills in Marmazza Valley 29½ tons, 15½ of which was washed and sent up mills under the old native mill, and put through the Val Toppa district, 563 tons; the same produced 244 ozs. 3 dwts. 17 grs. At the Pestarena district 3 tons were amalgamated, completing the cleaning up of old native mills: gold obtained, 5 ozs. 6 dwts. 9 grs. And at Battigiotto district 5 tons were milled in cleaning up the establishment; gold 2 ozs. 1 dwts. 12 grs.: total amalgamation from three districts being 571 tons, from which we obtained a total of 251 ozs. 11 dwts. 14 grs.—Mines: Val Toppa: No. 4 Level: In the end driving south we have now water coming from the end, have left the small lode reached for a future day, and turned to drive again on the slide. The branchy ground accompanying this slide is opening wide. Nothing as yet of much value; notwithstanding, we are encouraged by this and the water increasing as we advance into the mountain to expect another lode ahead of the present end. The following is our estimate of the value of the points in operation. In the rise in back of No. 4 level, on side of lode, east of main level, we have an improvement; lode worth 1½ ton of ore per fathom, at 2 ozs. of gold per ton. No. 3 level end, driving south on the great quartz lode, producing stones of ore. Rise in back of this level 10 tons at 7 dwts. per ton. This month a new slope will be carried south of rise on a lode 4 ft. wide, worth 9 dwts. per ton. The slopes in bottom of an intermediate level above No. 3, on a side lode, gives 7 tons per fathom, worth 12 dwts. per ton; and on the flat lode 9 tons, at 8 dwts. No. 2 level end driving north on the western lode, is poor at present. The end south of the fourth cross-cut, driving on a lode east of new lode, yields 8 tons per fathom at 8 dwts. per ton. The slopes in bottom, south of third cross-cut, on flat lode, 7 tons, at 8 dwts. No. 1 slope in bottom, on lode south of winze, 10 tons, at 13 dwts. The slopes north of winze, 12 tons, at 7 dwts. The No. 2 slopes in back of this level 12 tons, at 8 dwts. The No. 3 slopes 10 tons, at 9 dwts. The No. 1 level end south on the new lode 15 tons, at 6 dwts. The slopes in back of this level 12 tons, at 8 dwts. per ton. The intermediate end driving south under No. 1 level, on a small lode west of the great quartz lode, has improved, yielding 9 tons per fathom, worth 9 dwts. per ton. The end south in No. 1 level on the western lode 10 tons, at 8 dwts. The slopes in south bottom 12 tons, at 9 dwts.; and north 10 tons, at 8 dwts. The ground in the cross-cut west in the level above No. 1 is of a small though favourable nature.—Zero Level: The end on side lode south is not looking so well. No change in the new cross-cut west in this level.—Pestarena Mines: After the cutting of plat, and laying of tramroad in the 55, Aquavite Mine was completed. We resumed driving at this level on the lode, and am pleased to state that the end south has improved, worth now 5 tons of ore per fathom, at 15 dwts. per ton. We have suspended driving both ends, and commenced with the new shaft in Peschiera Mine at the deep adit, to drive north to line of shaft, and at the 33 to cross-cut to the line of shaft.

[For remainder of Foreign Mines see to-day's Journal.]

**GOLD MINING IN AUSTRALIA.**—The reports received from the Colony of Victoria show that the amount of gold being obtained appears to be well kept up. A vast amount of prospecting is being carried on at Sandhurst, which must in many instances be attended with prosperous results. The calls for the first six months of the present year amounted to 231,442, and the dividends to 282,778. The yields for the same period were 166,426 ozs., of the value of 656,584. The calls have exceeded the same period of last year by 157,402, which will give an idea of the great increase that has occurred this year in the working and prospecting of the mines of the district, and also in the erection of machinery, which has increased to a very great extent. The alluvial country round Dunolly has been famous for returning some of the largest nuggets ever found in the world, and on July 12 a man named Davey was rewarded by the discovery of a splendid lump of gold, he was working at Wilson's lead, about three miles from Dunolly, when he found the welcome stranger, which weighed 538 ozs. The prices of shares in the Great Extended Hustler's quartz mine, the tribute company of that reef, and Winter's Freehold alluvial mine fell considerably on a decline in the yield, which, however, it was maintained, was only temporary. The past half-year's gold yield in New South Wales shows an increase of 65,275 ozs.

**MONSTER GOLD CAKE.**—The retorting of the enormous mass of gold recently obtained from 16 tons of stone taken from Krohman's claim, on Hawkin's Hill, was an operation requiring no small ingenuity. The gold actually filed what is known in the iron trade as a 15-in. retort. To get it out of the vessel after being retorted was, therefore, a task of considerable difficulty. The following method was adopted with success: keys, or wedges of gold, were placed perpendicularly in the retort at intervals, so that there remained small spaces between them. The amalgam was then put in the retort in the usual way, the keys remaining of course untouched. In the openings made by these keys a crowbar was inserted, and the monster cake was thus easily lifted out of the vessel. The weight is 5612 ozs. It is calculated that the specimens sent to the Sydney Exhibition by Mr. Krohmann will yield an additional 1000 ozs. This is the largest cake of gold ever produced in Australia.—*Sydney Herald.*

**SMELTING IRON BY PETROLEUM.**—A joint-stock company is now being formed in Titusville, for the manufacture of pig-iron by means of petroleum oil in place of coal. The preparations have so far progressed, that the commencement of the new year will probably mark the new era in the iron regions. If successful, the experiment will revolutionise the iron trade in the United States, and render this country the cheapest iron-producing country in the world. So far, all the experiments in this direction warrant the most sanguine expectations. At present the fuel for making a ton of charcoal iron costs \$17, while it is calculated that the oil for making an equal quantity of iron would cost only \$7. Owing to the absence of impurities of sulphurous and other gases in the oil, the iron made from it is of the very best quality known in the market. The expenses of constructing the necessary buildings and appliances are one-half less with oil than with coal, while there is a similar economy in labour and other charges. There is also another point. It is calculated that the refuse matter from the oil, which is now regarded as of scarcely any marketable value, will be just as available for fuel as the crude. Petroleum fuel is as manageable as ordinary illuminating gas, and is just as safe. Its force or heat can be increased or diminished at pleasure, and by the same process. Hence it is applicable to a great many purposes beside the manufacture of iron. But the experiments heretofore made with petroleum fuel, though uniformly successful, were not on a scale calculated to produce any extensive results. The new oil blast-furnace to be built at Titusville will be especially adapted for the required purposes, and the result will be looked for with general interest as involving the future of the iron trade in America. If successful, as it undoubtedly will be if there are not very grave errors in the calculations of scientific men and experts, then the oil region will become the centre of a new industry. The Lake Superior ore can be laid down at comparatively little cost almost at the mouth of the oil wells, which will thus be invested with a new and increased value.—*New York Daily Bulletin.*

**CUDRA TIN MINES** were put up by auction by Mr. Thomas J. Sabine, at the offices of the company, on Wednesday, the 18th inst.; and were bought by Mr. Stephen Barke, of Birmingham, for the sum of 42500.

AWARDED TWENTY GOLD AND SILVER FIRST-CLASS PRIZE MEDALS.

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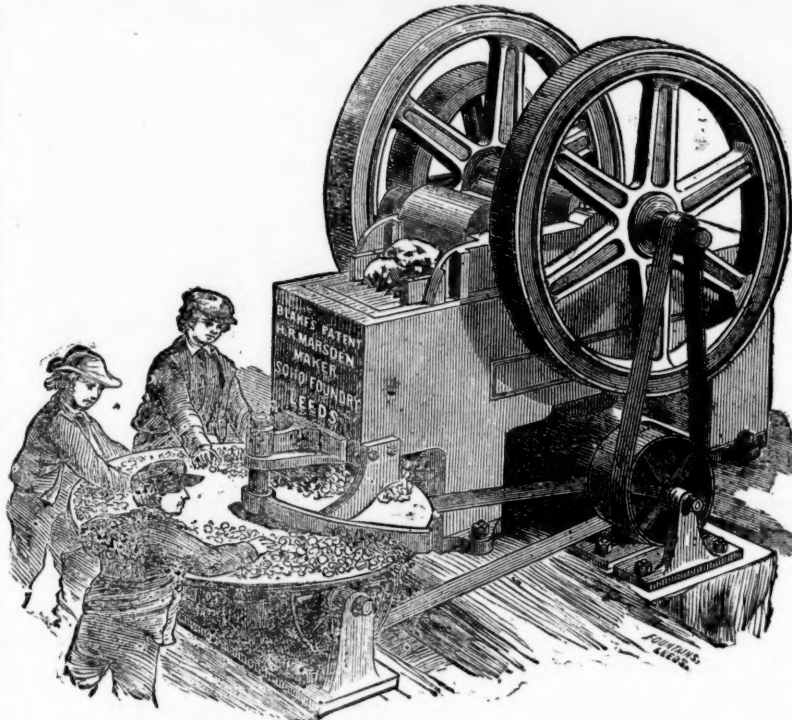
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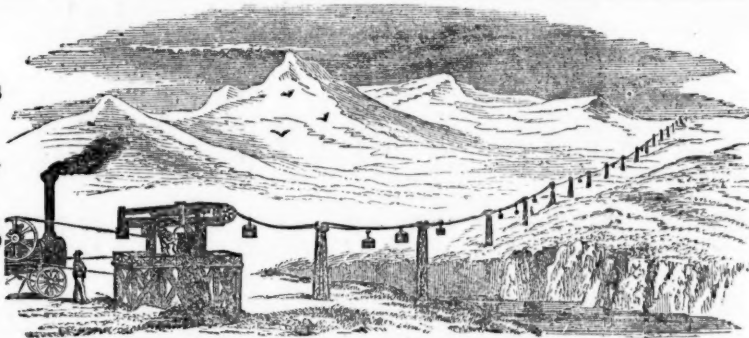
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Are PREPARED TO SURVEY and ESTIMATE for LINES and EXECUTE CONTRACTS at HOME and ABROAD. They have engineers employed in constructing these lines in England, Holland, Prussia, Austria, Russia, Italy, Spain, United States, Peru, Chili, River Plate, India, Bolivia, West Indies, and Egypt. The system has been adopted by the English and Anglo-Indian Governments, the Spanish and Prussian Governments, and for many of the first mines and ironworks at home and abroad.

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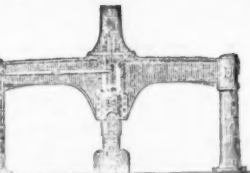
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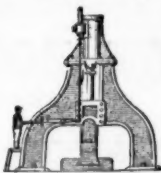
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**STEAM HAMMERS AND STEAM STAMPS MAY ALWAYS BE SEEN AT WORK.**

*The Parys Mines Company, Parys Mines, near Bangor, June 6.*—We have had one of your stone breakers in use during the last 12 months, and Capt. Morcom reports most favourably as to its capabilities of crushing the materials to the required size, and its great economy in doing away with manual labour.

For the Parys Mining Company, H. R. Marsden, Esq. JAMES WILLIAMS.

*The Van Mining Company (Limited), Van Mines, Llanidloes, Feb. 6, 1871.*—Our machine, a 10 by 7, is now breaking 180 tons of stone for the crusher every 24 hours. I may say, of all our machinery, that for simplicity of construction and dispatch in their work, they are equal to anything in the kingdom, but your stone breaker surpasses them all. W. WILLIAMS.

H. R. Marsden, Esq., Leeds.

*Chacewater, Cornwall, Jan. 27, 1869.*—I have great pleasure in stating that the patent stone breaker I bought of you some three years ago for mines in Chili, continues to do its work well, and gives great satisfaction. It crushes the hardest copper ore stone—put it through ½ inch size by horse power—with great ease. I can safely recommend it to all in want of a crusher; it can be driven by steam, water, or horse power. H. R. Marsden, Esq. JAMES PHILLIPS.

*Terras Tin Mining Co. (Limited), near Gram-pound Road, Cornwall, Jan. 1871.*—Blake's patent stone crusher, supplied by you to this company, is a fascination—the wonder and admiration of the neighbourhood. Its simplicity is also surprising. Persons visiting it when not at work have been heard to remark, "This can't be all of the machine." It will crush to a small size from 8 to 10 tons of very hard and tough elvan rock per hour; taking into its leviathan jaws pieces of the hardest rock, weighing 200 lbs. or more, masticating the same into small bits with as much apparent ease and pleasure as does a horse his mouthful of oats. On every 100 tons of the rock crushed by the machine there is a direct saving to the company of not less than £2 over the process of hand labour previously adopted by them, and the indirect saving much more, the machine being ever ready to perform the duties required of it. It breaks the stuff much smaller, and in form so fitted for the stamps, that they will pulverise one-third more in a given time than when performed by hand labour. J. GILBERT MARTIN.

H. R. Marsden, Esq., Leeds.

*Welsh Gold Mining Company, Dolgelly.*—The stone breaker does its work admirably, crushing the hardest stones and quartz. WM. DANIEL.

*Ovoca, Ireland.*—My crusher does its work most satisfactorily. It will break 10 tons of the hardest copper ore stone per hour. WM. G. ROBERTS.

*General Fremont's Mines, California.*—The 16 by 7 in. machine effects a saving of the labour of about 30 men, or \$75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered a third machine for this estate. SILAS WILLIAMS.

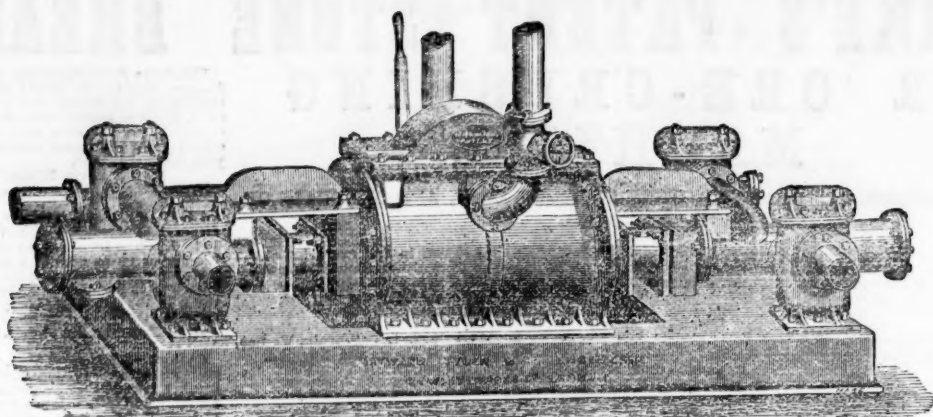
Your stone breaker gives us great satisfaction. We have broken 101 tons of Spanish pyrites with it in seven hours. EDWARD AARON.

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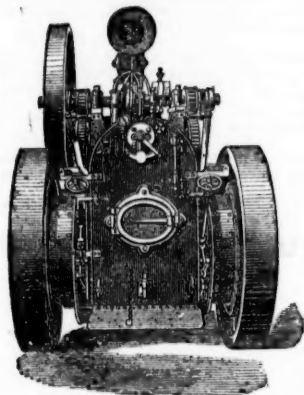
### TESTIMONIAL.

HAYDOCK, ASHTON EDGE GREEN, AND PARK COLLIERIES, near St. HELEN'S, LANCASHIRE, October 18th, 1871.  
GENTLEMEN,—We have one of your "UNIVERSAL" STEAM PUMPS continuously at work during the last ten months, and it does its work very well. It is suspended in a new shaft 60 yards deep, the steam to supply it being generated on the surface of the ground.  
(Signed) RICHARD EVANS AND CO.

Full particulars, post free, on application to—

**HAYWARD TYLER AND CO.,**  
84 AND 85, UPPER WHITECROSS STREET, LONDON, E.C.

## ROBEY AND COMPANY, LIMITED, ENGINEERS, LINCOLN.



### PATENT PORTABLE HAULING AND WINDING ENGINE WITH PATENT DRUM WINDLASSES, FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—Haulage along inclined drifts is easily and cheaply effected; The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required; It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery; It can be very quickly removed (being self-propelling), and fixed in any desired position.

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THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

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**IRON ROOFS, IRON BUILDINGS, IRON SHEDS,**

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IT DOES NOT GET OUT OF ORDER.

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PROGRESSES through Aberdeen granite at the incredible rate of 10" per minute.

SAVES £5 a day as compared with hand labour, independent of the enormous saving effected in the general expenses, such as PUMPING, VENTILATION, INTEREST OF CAPITAL, &c., from the fact of the "put-out" being increased four-fold.

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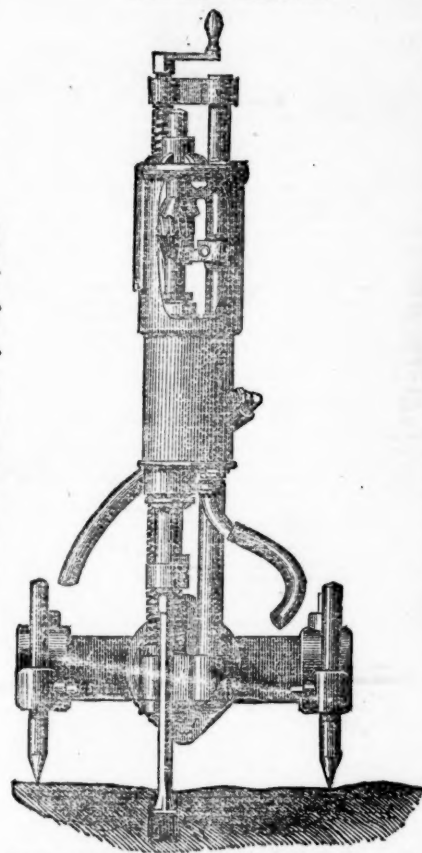
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500 TO 1000 STROKES PER MINUTE

(Counted by mechanism).

PENETRATES GRANITE 6 TO 12 INCHES PER MINUTE.  
MACHINES WARRANTED.



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This wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and, in this way, always assists it by whatever amount of power the water is capable of giving, and, therefore, saves so much fuel.

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